

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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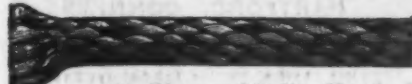
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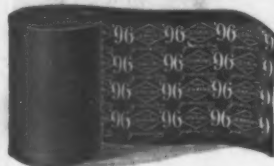
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THE IRON AGE

New York, Thursday, July 13, 1905.

Coal Handling Apparatus. Specially Designed for the Simonds Mfg. Company.

The Simonds Mfg. Company, maker of saws and machine knives, Seventeenth street and Western avenue, Chicago, Ill., has had in operation for some time an interesting coal handling equipment. The company's power house is equipped with four 250 horse-power Babcock & Wilcox water tube boilers, furnishing steam to a 500 horse-power compound engine for general power supply and also to two heavy duty direct connected rolling mill engines for the crucible steel department. The plant is of an intermediate size; hence it was a question whether it would be more advantageous to put in an elaborate coal handling apparatus or to handle the coal and ashes

The helicoid conveyor, which is behind the shields at the lower end of the boom and cannot be seen in the engraving, is right hand pitch on one side of the center and left hand on the other, its rotary motion tending to deliver the coal to the center, or in the path of the traveling elevator buckets. On the shaft carrying these helicoid conveyors are hardened steel pickers. These are simply short iron bars with pointed ends, which assist in breaking up the coal, especially when it is frozen. The entire carriage has a longitudinal feed of 6 to 9 inches per minute when the device is elevating coal and 15 feet per minute when traveling idle from one car to another. Power is furnished by a 20 horse-power electric motor, taking its current from a simple two-wire trolley.

The buckets are 12 inches long, 6 inches wide and 8 inches deep and are spaced 12 inches apart on the chain. There is said to be no difficulty in completely filling the

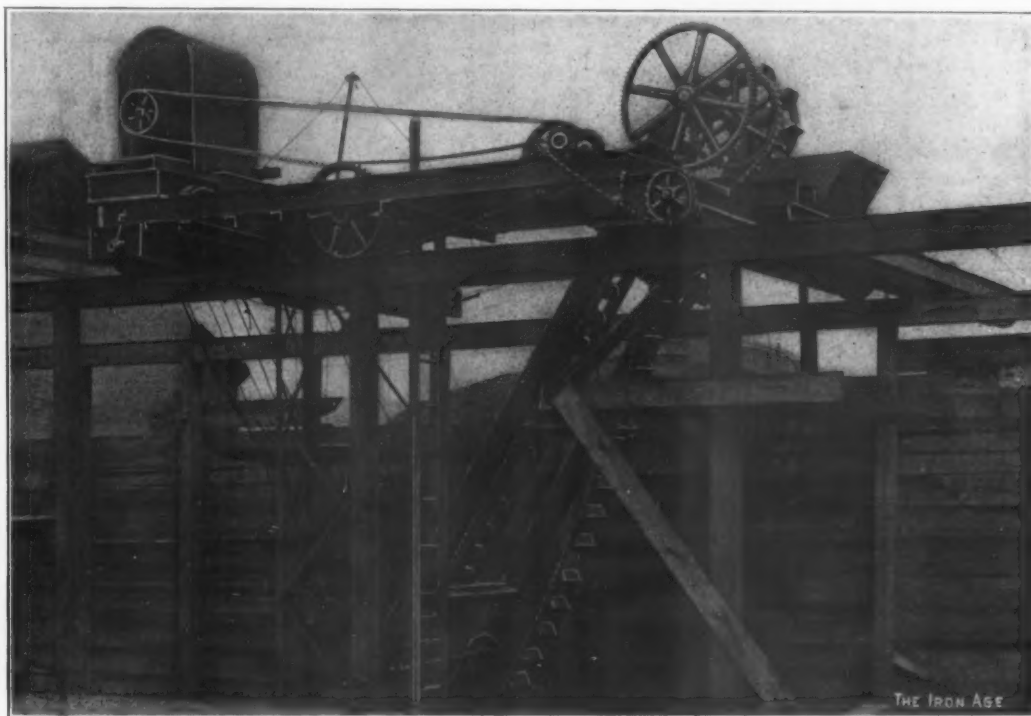


Fig. 1.—Machine for Unloading Coal Cars at the Simonds Mfg. Company's Plant, Chicago, Ill.

by hand. In taking up the matter with different companies manufacturing conveyors and coal handling apparatus the total cost of an outfit for this plant was variously estimated at from \$9000 to \$16000. Feeling that the saving in labor would not warrant this expenditure the apparatus herein described was designed, and so far has been satisfactory in every way.

Fig. 1 shows the coal car unloading machine, which travels on an elevated track running parallel and some 20 feet above the railroad track. The boom, or that part carrying the bucket elevator, is suspended from this traveling carriage and is completely controlled and operated by power. Fig. 2 shows the elevator at work and is taken from the rear of the boom. Fig. 3 is a detail view showing the lower part of the boom carrying the buckets, helicoid conveyor, pickers, &c. The principal points of interest are shown plainly in this view. The boom very nearly fills the space between the sides of an ordinary coal car and is kept from dragging on the bottom by guard wheels, which at all times keep the pickers, cleaning-up aprons, helicoid conveyor screws and other working parts about 1 inch from the bottom of the car.

buckets even thus closely spaced, as the helicoid conveyor delivers the coal directly into the buckets instead of leaving the buckets to pick up the coal.

A trough extends from the top of the carriage out over the storage bin, with suitable openings, which may be regulated so as to deliver the coal at any point crosswise of the bin. The trough contains a helicoid conveyor driven by a chain from the main shaft of the machine, which receives the coal elevated by the buckets and distributes it as desired in the bin. This is done very evenly, due to the longitudinal motion of the whole apparatus while at work.

The numerous controlling levers, clutches, &c., controlling and operating the different feeds, hoists, &c., have been designed so that it is impossible to get two opposing motions in the gear at the same time.

The elevator complete, including experimental work, has cost approximately \$2000, and with labor at 17 cents an hour makes the average cost to deliver the coal from the car to a 22-foot level $1\frac{1}{2}$ cents per ton, or less than one-third the cost of unloading by hand. The average time in unloading a 30-ton car is 65 minutes, and the

time getting from car to car from five to ten minutes, based on the distance the boom has to be raised, the length that has to be traveled to the next car and other conditions. One man operates and takes care of the machine and easily cleans up what little spill there is left behind the buckets, keeping this always shoveled through to the front side of the aprons; so when the elevator has reached the end of the car the work is all completed, and there is no sweeping or cleaning up of any kind after the apparatus has been taken out of the car.

A novel apparatus for handling the coal from the bin to the boilers is also used. This outfit consists of a tunnel extending the whole length of the 110-foot bin and the length of the boiler house. The part extending into the boiler house is located immediately in front of the ash pits and 8 feet below the level of the main power house floor. At the end of the power house nearest the coal bin is located an hydraulic elevator, which is used to elevate cinders and also coal. The coal is taken through small sliding gates, located at intervals of 36 inches in the bottom of the bins, into small side dumping cars holding approximately 600 pounds. These cars are pushed by hand on a narrow gauge railway to the hydraulic elevator and are carried to a level that allows them to be dumped

day of any coal that can be handled in bucket elevators an outfit of this kind is eminently suitable.

The conveying and elevating machinery described was built and installed by the H. W. Caldwell & Son Company, Chicago, Ill.

An Important Trademark Decision.

WASHINGTON, D. C., July 10, 1905.—A comprehensive decision of much importance to trademark owners has been rendered by the Commissioner of Patents and sustained by the Court of Appeals of the District of Columbia under the new trademark act, which took effect April 1. This decision determines an issue of far-reaching consequences, holding in effect that a large class of applications under the old law, which have been assumed to be still pending on appeal in the Patent Office, although adversely acted upon, cannot be further considered under the new law, but must be treated as finally rejected under the former statute, and can only be revived by the filing of new applications under the present trademark law. Applicants whose cases come within the scope of this decision will be put to considerable expense, as they will be obliged to begin proceedings *de*

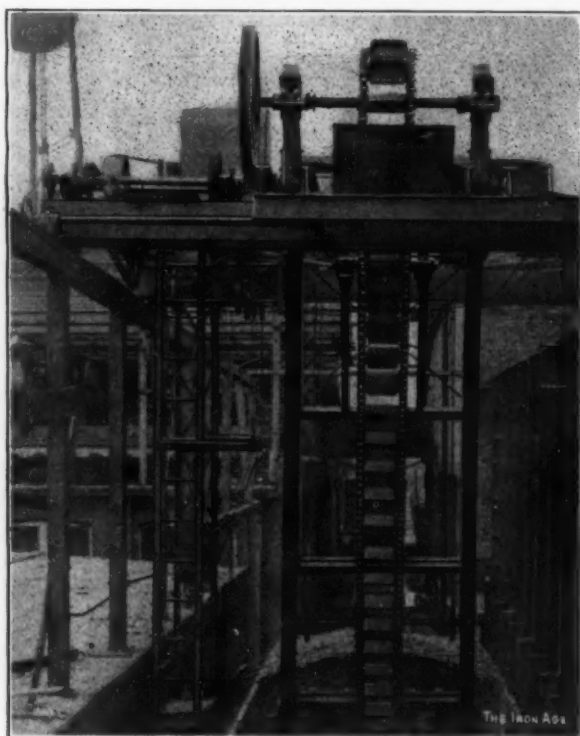


Fig. 2.—An End View of the Coal Unloading Machine.



Fig. 3.—Nearer View of the Lower End of the Machine at Work.

directly into the hoppers of the automatic traveling grates which are used on these boilers.

The cinders are raked and shoveled into the cars and removed through that part of the tunnel located in front of the ash pits. The cars are elevated by the elevator used for the coal and are carried out over an elevated steel runway, which is on the same level but has no connection with the track from which coal is supplied to the hoppers over the grates.

Compared with more elaborate equipments, which are without question more economical for larger plants than the apparatus just described, this system is elementary; but the Simonds Mfg. Company found that none of them would save any more labor than the device described, and the repairs and upkeep have been merely nominal. The behavior of the apparatus in cold weather is stated to be especially satisfactory, no trouble having been experienced in two winters from frozen coal either in the cars or in the bins. It is not believed that a system of this kind would be suitable where the consumption would warrant more extensive conveying apparatus, but it would seem that for plants using from 50 to 75 tons per

novo and again pay all fees provided by the statute. The rights of such trademark owners, however, are not prejudiced by the decision, but, on the contrary, it is probable that in many cases trademarks rejected under the old law will be found to be registrable under the new statute.

Statement of Case.

The case upon which the Commissioner and the court have ruled was that of a trademark owner whose application was rejected under the old trademark law of 1881, and who undertook to amend his original application so as to bring it within the scope of the new law, Section 14 of which provides "that an application for registration of a trademark pending at the date of the passage of this act, and on which certificate of registration shall not have issued at such date, may at the option of the applicant be proceeded with and registered under the provisions of this act without the payment of further fee." Section 24 of the act provides that "all applications for registration pending in the office of the Commissioner of Patents at the time of the passage of this act may be amended with a view to

bringing them and the certificate issued upon such applications under its provisions, and the prosecution of such applications may be proceeded with under the provisions of this act."

Relying upon the clauses above quoted, the applicant sought to bring his case under the provisions of the new law by filing an amendment, but the examiner refused to entertain it and also refused to consider the question whether the alleged trademark was registrable under the new statute, holding that this was not a "pending" case within the meaning of the law and that therefore the applicant was not entitled to amend it to bring it under the provisions of the new law. An appeal having been taken to the Commissioner of Patents, that officer rendered a decision sustaining the examiner on all points in an opinion from which the following extracts are taken:

Commissioner's Opinion.

The sole question presented by this appeal is whether the applicant is entitled to amend the case under the provisions of the statute above quoted. This is more in the nature of a petition that the examiner be directed to enter the amendment and consider the case on its merits than an appeal from a decision rendered. There has been no decision upon the question whether the mark which was presented in this application would be registrable under the act of February 20, 1905, to the party who filed this application. The permission of the amendment seems to be a condition precedent to a consideration of and decision upon the case under the new law. Since the examiner has refused to permit the amendment and has refused to decide the case under the act of February 20, an appeal under that act does not seem to be the proper remedy. The case must be decided under the new law before there can be an appeal under that law.

It is undoubtedly true that final judgment was entered in this case long before the law of February 20, 1905, was passed. Such judgment was entered by the Examiner of Trademarks and was affirmed by me on January 2, 1903, as the final judgment in this case. Neither the decision nor the act of 1881, which was in force until April 1, 1905, nor the Rules of Practice of this office gave the applicant authority to amend or take further action of any kind in the case. The case was, therefore, to all intents and purposes dead.

Even if it could be held that the applicant was entitled to revive the case by a petition for rehearing, it is very clear that he should have taken that action before the law under which it was filed expired. Ample notice was given of the date when the law would expire, and since the applicant permitted this case to remain as one finally settled until after the expiration of that time it is now too late to revive it for the purpose of bringing it under the new law.

Could it have been the intention of Congress in the above quoted provisions of the act to set aside and nullify all adjudications in trademark cases for the past 24 years? I think not. Judging the intention by the words of the act, it seems clear that such was not the intention, since the right of amendment was specifically confined to cases which were pending at the time of the passage of the act. In limiting the right to cases pending at a particular time Congress said by implication that there are cases which are not pending. If the applicant's contention was sustained it would follow that all cases filed since the passage of the act of 1881 are pending and that word as used in the statute would have no significance. It is not to be presumed that this word of limitation was used without intention or effect.

It must be held that the Examiner of Trademarks was right in refusing to permit the amendment in this case and in refusing to consider and decide the case under the act of February 20, 1905.

Since this case is not under the act of February 20, 1905, and no decision has been rendered as to the right to register the mark under that act, the present appeal cannot be regarded as properly taken under that act. The appeal is dismissed.

Court Sustains Commissioner.

An appeal having been taken from the Commissioner's decision to the Court of Appeals of the District of Columbia, an opinion has been handed down sustaining the Commissioner and holding that the rejection of the application under the old law finally disposed of it in default of a request within a reasonable length of time for a rehearing and that the repeal of the act of 1881 closed the door for any further proceedings upon the original application. Several hundred cases now before the office will be finally rejected under this decision, but doubtless many of them will be revived by the filing of new applications in conformity with the provisions of the new trademark act.

W. L. C.

The Ernst Wiener Company.—Ernst Wiener has severed his relations with the house of Arthur Koppel, with which he had been connected for 18 years, 8 of which were as manager of the New York office, and has opened offices at 68 Broad street, New York City, under

the firm name of Ernst Wiener Company. The new company will make a specialty of railroads and railroad materials of both narrow and standard gauge for all industries. A special factory equipment with wholly modern machinery has been built in Youngstown, Ohio, for the purpose of exclusively building the specialties of the new firm, so that it is in excellent condition to take care of all business. A large stock of rails, industrial track, switches, cars, &c., will always be kept. Associated with Mr. Wiener in his new enterprise is Carl Koch, for many years chief engineer of Arthur Koppel, as well as the larger part of his former staff. The new company is now ready for business.

The Crane Company Jubilee.

During the last week the Crane Company, Chicago, has been celebrating the fiftieth anniversary of the founding of the business. Fifty-five managers of branch houses with their families were called together from the Atlantic to the Pacific in Chicago, July 3, where they were domiciled at the Auditorium Annex at the company's expense for several days. A banquet to these managers and to local department managers was given by Mr. Crane at the College Inn of the White City, Monday evening, and Tuesday morning the visitors went to Lake Geneva, Wis., as Mr. Crane's guests, where they were entertained during July 4 and 5 at Mr. Crane's summer home, Jerseyhurst. Features of the Lake Geneva jaunt were excursions on the lake on the host's launch and a set dinner, at which addresses of a felicitous nature were given and a presentation to Mr. Crane by his guests of a bronze statue.

On the evening of the 5th the party returned to Chicago, and on the following day participated in a grand picnic at Northwestern Park and the Des Plaines River, which was given by the company to all its employees, the works being completely closed down for this purpose. On this occasion 5500 employees, together with their families, aggregating fully 15,000 people, were entertained in various ways. The picnic was managed by committees of employees, though the expenses were borne by the company. It required 18 ten-car trains to carry those of the picnickers who left the Chicago & Northwestern depot.

R. T. Crane, the president of the company, delivered an address to his men in which he earnestly sought to overcome the increasing feeling of hostility held by employees toward the employing class, showing the men that the interests of the two branches were mutual and interdependent. Many prizes were awarded. J. Dominick, who had the largest family present, consisting of himself, wife and eleven children, was presented with a silver tea set. The four employees longest in the service of the Crane company—Cornelius Haley, 42 years; Edward Gregg, 40 years; John Quigley, 38 years; L. Pilkington, 38 years—were each given a gold watch, as were Pauline Leverenz, 24 years, and her sister, Hertha Leverenz, 18 years, the two women longest in continuous service of the company. A canvass of the employees showed that there were 42 men present who had served the company continuously for 25 years or more. This means that about 6 per cent. of the number of employees who were with the firm in 1880 are still in its employ. In 1880 there were 700 employees, and now there are eight times as many.

During the jubilee week a dinner was given to the out of town managers and to the managers of local departments, including shop superintendents and foremen, by Richard T. Crane, Jr., at the Auditorium.

The business was founded by the present president as a small brass foundry in the corner of a lumber yard of Martin Ryerson, Mr. Crane's uncle, and the first casting was made July 4, 1855. Officers of the Crane company are now: President, Richard T. Crane, Sr.; first vice-president, C. R. Crane; second vice-president, Richard T. Crane, Jr.; secretary, A. F. Bennett; treasurer, A. F. Gartz. The company is stated to be the largest manufacturer in the world of valves and fittings, in addition to being a large factor in the manufacture and sale of special machinery, tools and supplies used in steam and hot water heating, water works supplies, gas fittings, &c.

The Flather Quick Change Feed Lathe.

The quick change feed engine lathe shown in Fig. 1 combines a number of interesting devices for procuring a wide range of feed and screw cutting, together with accuracy and facility of operation. The compactness of the arrangement of the gear box at the front of the head, an interior view of which is given in Fig. 2, and of the covered gearing at the head of the machine are noticeable. The slotted steel strip on the under side of the gear box,

central position the feed screw is driven by the gears L O. By moving the lever to the right gear O moves clear of its gear L into the space R and the clutch teeth on gear O engage clutch teeth on gear N, affording a second series of speeds. When the lever is moved to the left the gear O engages gear P in a similar manner and a third speed is procured. As a result 54 changes are procured, cutting threads from 2 to 128 to the inch and giving feeds from 7 to 418 to the inch.

To insure that the intermediate gear K always

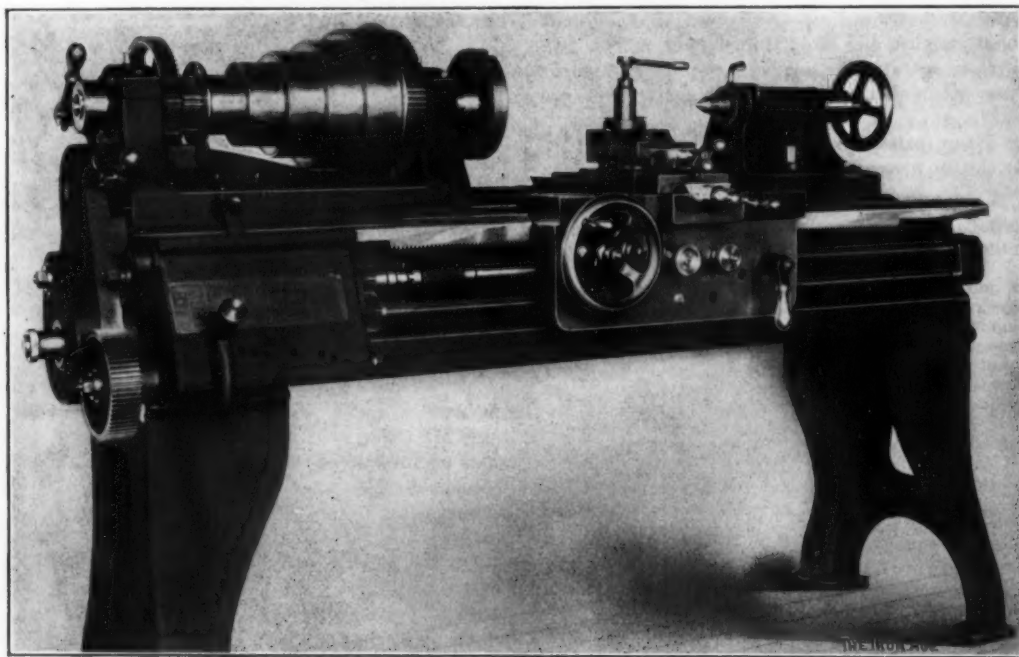


Fig. 1.—A New Quick Change Feed Lathe, Built by Flather & Co., Nashua, N. H.

in connection with a projection on the lever, makes it impossible to strike any one of the gears of the cone excepting that which corresponds with the slot and its hole for the locking pin on the lever. A distinguishing feature of the device is the sweep, which is made in box form, completely inclosing the train of gearing connecting the spindle with the gear box, protecting the gearing and also the workman from injury. The mechanism provides 54 different feeds and threads without removing any gear, but when it is desired to use a different thread or feed than those shown on the index plate a gear can be substituted for that on the driving shaft, the sweep being made adjustable for this purpose. This lathe is manufactured by Flather & Co., Incorporated, Nashua, N. H.

Referring to Fig. 3, the head stock spindle is shown at A, and from it is the usual train of gears to the gear B mounted on the feed shaft. This gear meshes with gear C, which is keyed to the pinion D, the space between them being slightly greater than the width of the gear G. Gear C and pinion D rotate constantly on the stud E. The double sliding gear G and H is mounted on the stud F. When the sliding gear is pushed in the gears B, C and H are in train. When it is pulled out the gears B, C, D and G are in train. Thus two series of speeds are obtained, the ratio between them being 8 to 1. The gear G is always in mesh with the gear I on the driving shaft, which is double the width of gear G to make possible the constant mesh. The gear I is changed when it is desired to cut special or odd threads not on the index.

Teeth are cut on the driving shaft J, Fig. 4, thus forming the driving pinion. The usual tumbler gear and lever are used for procuring the changes of speed in the gear box, the intermediate gear K meshing with a series of cone gears, L L. Above the cone L is a shaft, M, upon which are mounted the three gears N, O and P. Gears N and P run loose on the shaft and O is splined to it. These gears are in mesh with three of the cone of gears which drive them at different speeds. On the hubs of N, O and P are clutch teeth, so that when the lever Q is in its

comes into proper mesh without striking the corners of other gears of the cone there is fastened to the under side of the box a steel strip having slots, S, Fig. 3, corresponding to the several gears of the cone, and on the lever is a projection, T, Fig. 4, which when the lever is lowered to take the intermediate gear out of mesh with the cone moves out of the slot, allowing the lever to

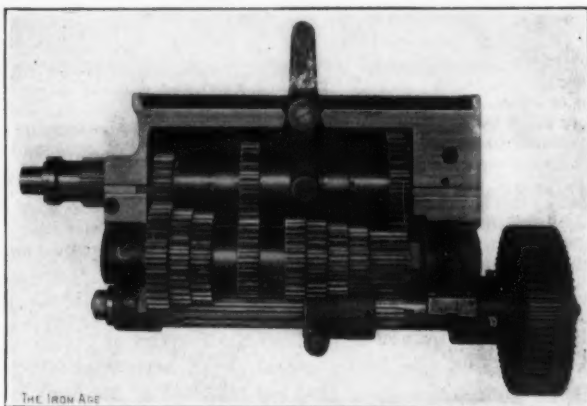


Fig. 2.—Interior View of the Feed Gear Box.

be moved longitudinally but preventing it from being raised until the projection is opposite a slot and the intermediate gear is in proper position to mesh with another gear on the cone.

The general features of this lathe are those of the usual Flather type of machine.

It has been announced that the promoters of the tin plate factory at Morrisburg, Canada, have secured control of the Canadian Tin Plate & Sheet Steel Company,

that Montreal and Toronto capitalists have become interested and that the work will go on at Morrisburg. The capital stock will be \$1,500,000. A plant of 28 mills is projected.

The Victoria Falls Bridge.—Just below the famous Victoria Falls of the Zambesi, in the interior of Africa,

teract the sagging of the cable as the traveler crossed the chasm. The conveyor was suspended from two wheels running on the rope, and consisted of a frame with a chair for the driver and the motor for propulsion. It was capable of carrying a load of 10 tons, and could make 80 round trips in the course of a day, making its daily capacity 800 tons. It is estimated that about 40,000 tons

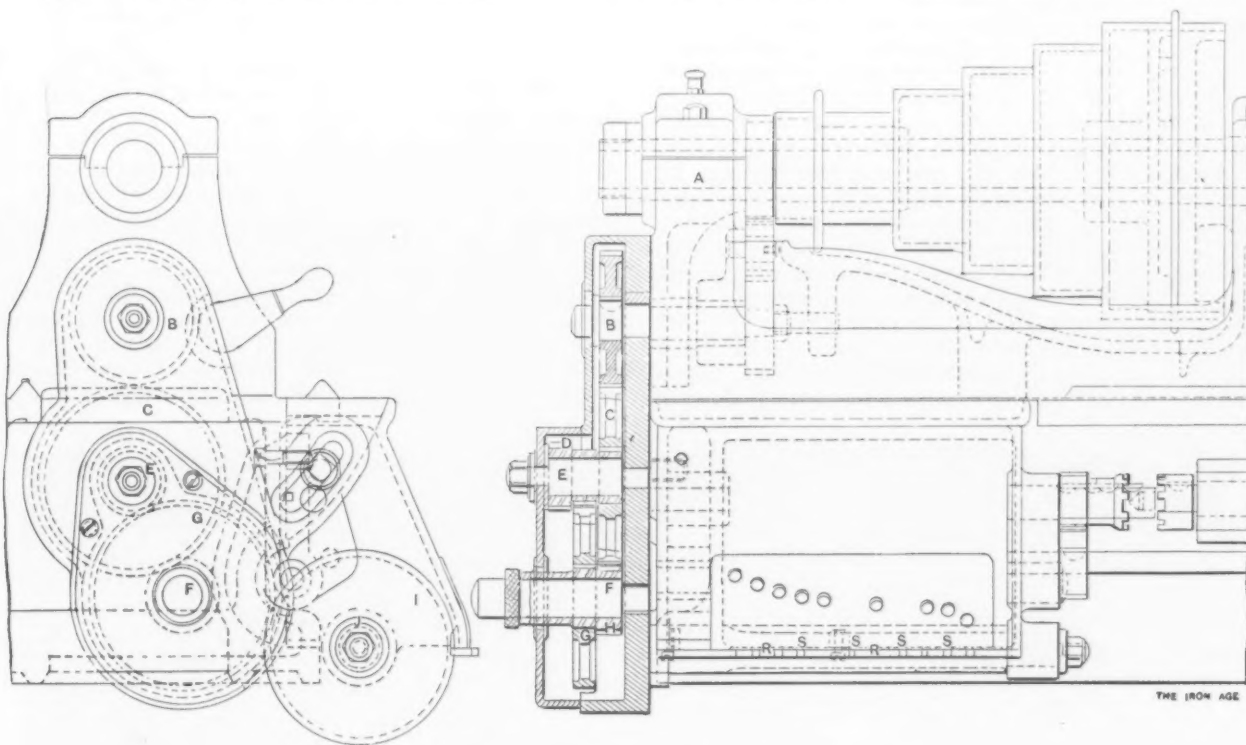


Fig. 3.—Detail of the Head of the Flather Quick Change Feed Lathe.

has been placed a steel arch bridge, built out on the cantilever system from each side until a junction was effected in the center. This bridge is located 1635 miles from Cape Town, on the main line of the Cape to Cairo railroad. It is more than 400 feet above the water which it crosses, its length is 500 feet and its width is sufficient

of material were sent across before the completion of the bridge. The Victoria Falls have more than double the height and are twice the width of Niagara Falls.

The Norton Grinding Company, Worcester, Mass., has found white varnish an excellent substitute for slush on

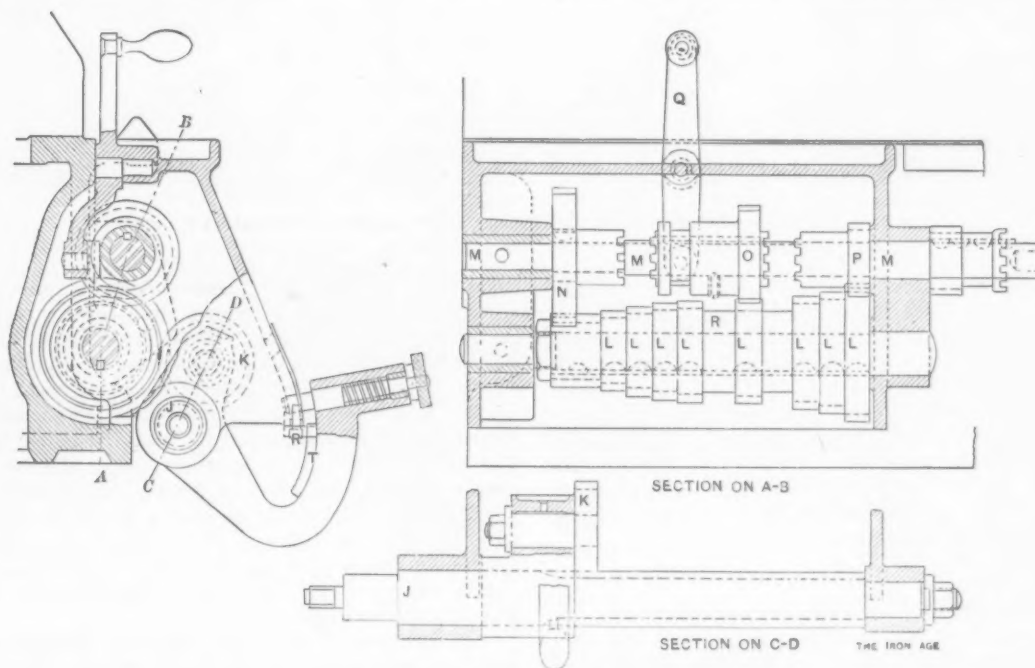


Fig. 4.—Detail of the Flather Change Gear Feed Mechanism.

for a double track. To carry across to the north bank the materials with which that end of the bridge was constructed a novel cableway, electrically operated, was used by the British builders. One end of the cable was attached to a rigid tower, while the other was attached to a hinged support loaded with a heavy weight to coun-

finished parts of machines which would not naturally be reached by the cotton waste of the operatives. Countershafts are improved in appearance thereby. The varnish costs no more at the most than the slush, is equally weather proof during shipment and looks better after the part has been put into use.

The Midland Steel Company.

Application for a charter for the Midland Steel Company, with a capital stock of \$3,000,000, has been filed at Harrisburg, Pa. The incorporators of the company are H. C. Fownes, Charles McKnight, J. Ramsey Speer, J. McK. Speer and Wm. C. Fownes, Jr., and the officers will be H. C. Fownes, president; J. Ramsey Speer, vice-president; Charles McKnight, treasurer; Wm. C. Fownes, Jr., secretary, and Geo. K. Hamfeldt, general manager. The above officers, together with W. C. Fownes and J. McK. Speer, constitute the Board of Directors.

Geo. K. Hamfeldt until June 1, 1905, was superintendent of the Carrie Furnaces of the Carnegie Steel Company. This plant was developed largely under his supervision, he having designed and built the third, fourth and fifth stacks. Mr. Hamfeldt will have complete charge of the construction work of the Midland Steel Company. His offices for the present will be with the S. Jarvis Adams Company, Fourteenth and Etna streets, Pittsburgh, Pa.

The company has acquired a piece of ground comprising 1000 acres, known as the Cooks Ferry tract, situated on the Ohio River about 40 miles below Pittsburgh. The

A Railroad Yard Electric Compressor Plant.

The air power plant at the terminal station of the Chicago & Northwestern Railway in Chicago is an example of modern practice in the application of electric power to the compressing of air for the many purposes characteristic of railroad yard work. The plant is located in a small brick building in the rear of the main terminal station, close to the river and adjacent to the extensive passenger yards of the company. This building consists of two rooms, one containing the steam boilers for the heating system of the station and the other the electrical and pneumatic apparatus.

Alternating current is taken from the city mains of the Chicago Edison Company and transformed to the working voltage, part being used directly on low voltage alternating circuits and the remainder converted to direct current for power purposes.

The air compressor plant comprises two Ingersoll-Sergeant type JC power driven compressors. They are duplex two-stage machines, with air cylinders, frames and bearings, mounted on a solid cast iron bed plate which incloses the horizontal intercooler between the cylinders. Both high and low pressure cylinders are

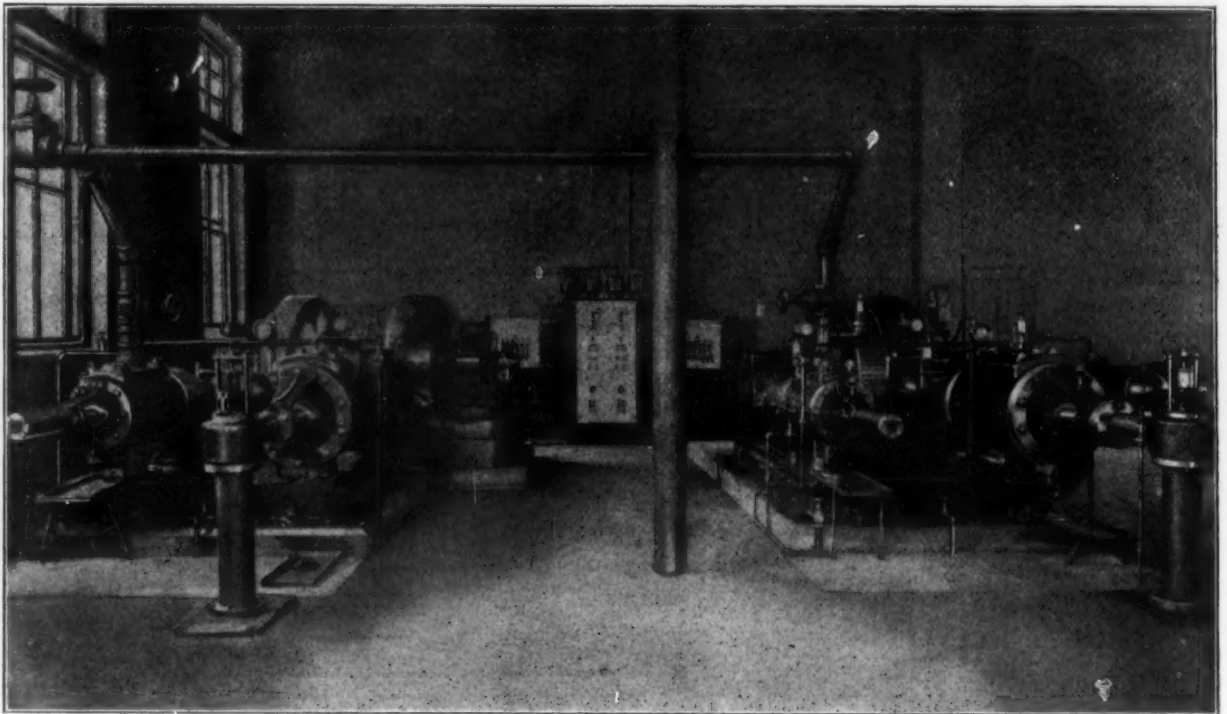


Fig. 1.—View in the Compressor Plant of the Chicago & Northwestern Terminal, at Chicago, Ill.

ground is perfectly level, well above high water and is ideal in every respect for manufacturing purposes. A town will be built upon the site, to be known as Midland.

In addition to the manufacturing site at Cooks Ferry the company has purchased 900 acres of fine coal property located in the fourth pool of the Monongahela River.

A large force of draftsmen has been at work for some weeks past on plans for coke ovens, blast furnace and steel plant, but at the present time those interested do not care to give out for publication just what finished products they will manufacture.

From data recently published in connection with the present tendency in American colleges toward engineering as compared with arts it is found that, taking 18 of the leading institutions which offer courses in arts, sciences and engineering, the ratio of increase during the past four years in arts and science has been but 15 per cent., even though these courses include practically all of the women students. As against this increase is set that for engineering, which is no less than 102 per cent. The figures include only regular students and seem to form one of the signs of the times.

fitted with the standard Ingersoll-Sergeant piston inlet valves, and regulation is secured by a choking controller on the low pressure intake. This device, acting to throttle the air intake passage, is controlled by receiver pressure and automatically regulates the volume of air compressed, and consequently the amount of power consumed, according to the demand for air from the power system. The compressors run at constant speed, the controller simply varying the effective piston displacement with varying load. The machines have a stroke of 12 inches, with air cylinders 12¼ and 18¼ inches in diameter. At 130 revolutions per minute the free air capacity of each unit is 455 cubic feet per minute. The pressure used is 70 to 80 pounds gauge.

The sub-base of each compressor is extended to support the driving motors, which are General Electric direct current machines rated at 80 horse-power and 510 revolutions per minute on 220 volts. A pinion on the motor shaft gears directly with teeth on the compressor fly wheel, the gears being protected by guards. Independent concrete foundations are used. Each unit has its own automatic oiling system on all bearings, fed from a central tank. The drip is recovered and filtered. Sight feed oilers care for cylinder lubrication.

Fig. 1 shows the arrangement of the air plant and Fig. 2 a side view of one of the sets. The machines are side by side, the switchboard, rheostats, meters, &c., being mounted in front of and between them. An intake duct supplying both compressors extends under the floor to the open air and rises beside the power house, terminating in a screen cover to exclude dust and cinders. The discharge pipes from the two units combine in an air main leading to the primary receiver outside the plant. Provision is made for draining this receiver. From this point the line leads to a system of cooling tubes to the west of the power house, made up of a large upper and lower horizontal header, connected by a number of small vertical pipes. This apparatus freely exposed to the air precipitates whatever moisture may remain in the air after leaving the primary receiver, and this water is withdrawn from the lower header. From the cooler air lines radiate throughout the yard, supplying power to the pneumatic switch and signal system controlling the movement of trains in the terminal track system. Secondary air receivers are also located at suitable places. Most of the air is used in this system of switches and signals, but a small portion is diverted to the boiler room,

to present stockholders, three-fifths in return for their present holdings and two-fifths for cash at par.

The Knoth Slag Process for Manufacturing Steel.

On May 2, 1905, letters patent were issued to Henry Knoth, formerly superintendent of the steel plant of the Tennessee Coal, Iron & Railroad Company, at Ensley, Ala., and now superintendent of the Monterey steel plant at Monterey, Mexico, for a process which has proved successful in increasing the output of steel while reducing the cost of production. Mr. Knoth, who has given considerable study to the manufacture of basic open hearth steel, reached the conclusion that the present method of manufacturing steel could be greatly improved if a liquid basic slag could be provided at a minimum expense to start the heat quickly into action. When the molten slag is tapped from an open hearth steel furnace and thrown away there is a loss, not only of considerable basic materials but also of the heat in the slag. Obviously, if this heat and these basic properties can be successfully utilized in purifying other heats an economy

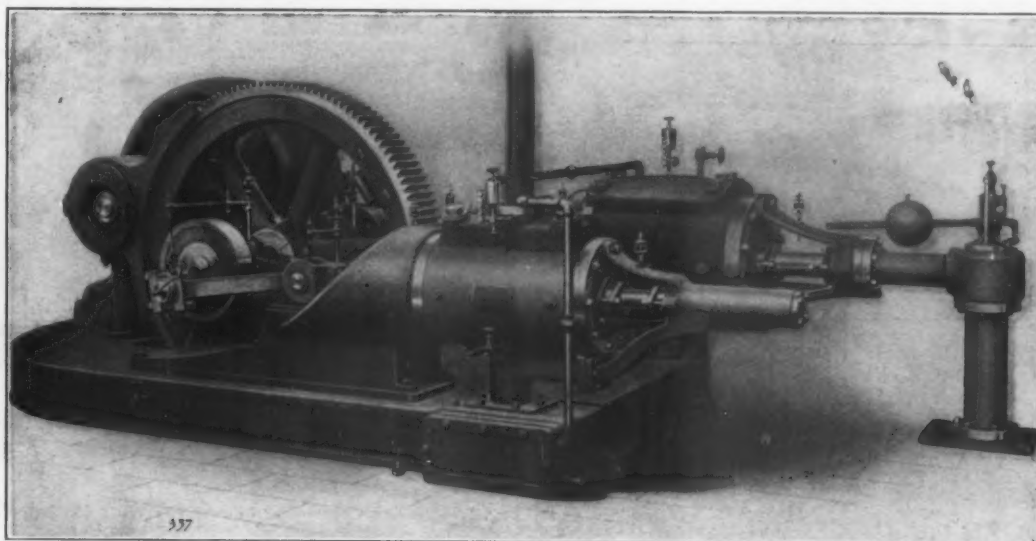


Fig. 2.—Another View of One of the Motor Driven Compressors in the Chicago Terminal Plant.

where it is applied in a small air lift pumping outfit which supplies water to the terminal.

The Arizona Copper Interests of Iron Men.

By resolution of the directors of the Calumet & Arizona Mining Company the proposed consolidation of various copper mines in the Warren district of Arizona has been deferred. The conditions at some of the mines are such as to make it difficult to determine any proper basis for consolidation at this time, and probably for some time to come. This company has some 1700 stockholders, but the majority of its 200,000 shares is in the hands of very few, the estate of the late H. W. Oliver holding more than any other single interest.

It was decided by the Board of Directors of the Calumet & Pittsburgh Mining Company, an affiliated company, that the stock remaining in its treasury, amounting to 50,000 shares, par value \$10, shall be issued at once at par to holders of the present stock, at the rate of one new share for every four now held, half to be paid August 1 and the balance in November. The company has been at enormous expense pumping water, and has incurred a debt of about \$200,000; in addition to pumping from the depth of 1055 feet it is sinking two large shafts, one to go immediately some 50 feet more to the 1100-foot level and the other from the surface to 1000 feet.

The directors of the Junction Development Company, another affiliated company, decided to reorganize into a mining corporation and to increase the stock from \$750,000 to \$3,000,000, of which all but \$500,000 shall be issued

in manufacture will result. According to the Knoth slag process the liquid slag, resulting from an initial heat prepared in the usual manner in a basic open hearth furnace, is used continually to purify subsequent heats by being returned to the same furnace, unless it is stopped for considerable repairs, and in that event to any other furnace then ready for it. The losses in the basic properties of the slag by continually purifying heats are replaced by lime or other desirable fluxing materials.

Preferably the unpurified metal to be acted upon by the molten slag is introduced into the furnace in a molten condition, or, better, is first blown in an acid converter. In both cases the reactions will at once set in in the bath, since the slag is in a ready condition. The duration of the heat is thereby considerably reduced. This process is being used at the Monterey steel plant, where it has uniformly given excellent results. Thus, 24 tons of pig iron (1.50 per cent. silicon, 30.40 per cent. manganese, 50.06 per cent. sulphur and 0.12 per cent. phosphorus) were melted with 6 tons of scrap without additions and tapped with 1 per cent. carbon into an open hearth furnace. The slag from a previous heat in this furnace was returned thereto in liquid condition with about 1000 kg. of limestone. The liquid slag immediately acted on the limestone, and after the addition of some fluorspar the reaction began at once. After adding ore several times the heat was tapped in 2 hours and 35 minutes. This process was repeated a number of times with substantially similar results. Below are the analyses of the unpurified metal, the slag and the steel as tapped in three succeeding heats, the times for the heat being given:

Duration of the Heat from Charging of the Liquid Material Till Tapping.

No. 1. 2 hours 35 min.	No. 2. 2 hours 40 min.	No. 3. 2 hours 5 min.
---------------------------	---------------------------	--------------------------

Analysis of Unpurified Metal Charged.

	No. 1. Per cent.	No. 2. Per cent.	No. 3. Per cent.
Silicon	Trace.	Trace.	Trace
Manganese	0.14	0.16	0.15
Phosphorus	0.115	0.121	0.130
Sulphur	0.061	0.065	0.064
Carbon	1.05	0.96	0.89

Analysis of the Slag.

	No. 1. Per cent.	No. 2. Per cent.	No. 3. Per cent.
SiO ₂	12.96	12.77	11.76
Al ₂ O ₃	7.89	8.11	7.93
Fe	15.40	11.48	14.39
CaO	48.47	47.50	44.79
MgO	6.62	7.28	8.51
MnO	2.00	2.38	2.95
S	0.38	0.45	0.46
P ₂ O ₅	1.80	2.96	4.35

Analysis of the Steel.

	No. 1. Per cent.	No. 2. Per cent.	No. 3. Per cent.
Manganese	0.38	0.32	0.45
Phosphorus	0.01	0.006	0.012
Sulphur	0.045	0.038	0.049
Carbon	0.10	0.09	0.23

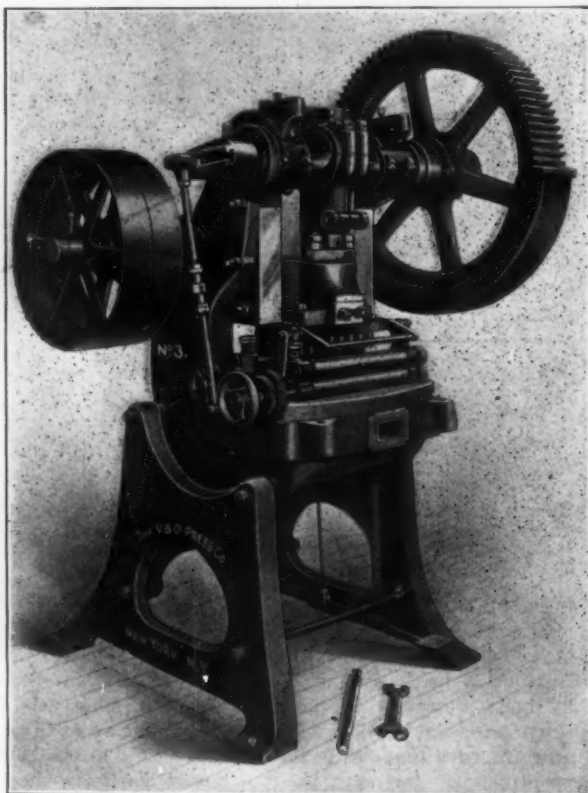


Fig. 1.—A No. 3 V & O Inclinable Geared Power Press.

These analyses are furnished by Franz Putsch, chief chemist of the Monterey Steel Company.

The process will operate most successfully when the pig metal is treated in an acid converter, and it is clear from the results above obtained that where the unpurified metal is blown in the converter to 1 per cent. carbon and then charged into an open hearth furnace and treated in accordance with the Knoth slag process a production of 200 tons of steel within 24 hours can be easily obtained from a 30-ton furnace.

The Knoth process will be of considerable importance to Southern steel manufacturers. It is believed that the saving in basic materials largely offsets the cost of blowing the metal in a converter and would cheapen the duplex process, such as is now being successfully carried out at the Ensley steel plant. In addition to this the other advantages of the process consist in the increase of production, the short time of the heats in the furnace and a correspondingly increased life of the furnace hearth, the opportunity to repair the furnace bottom between heats without interrupting the continuity of the process, the

utilization of all the basic properties in the slag and the reduction of the quantity of material thrown on the slag pile and handled at an expense.

A Special V & O Geared Power Press.

The machine illustrated in Fig. 1 is a No. 3 V & O inclinable geared power press specially equipped for the rapid manufacture of disks of the form shown in Fig. 2 and known as roofing caps. The presses are made in a series of seven sizes, ranging in weight from 500 to 5500 pounds, and are so arranged that a great variety of automatic feeds and appliances for the economical production of sheet metal goods in various forms can be attached to them.

The press illustrated is provided with a nest of 17 punches and dies, an automatic gauge, a set of double roll feeds and a positive knockout. It is designed to take 14 x 20 inch sheets of tin of any gauge and is capable of turning out roofing caps at the rate of 91,000 per hour. The sheets of tin are placed by the operator to an automatic gauge and are then carried through the dies and punches automatically by the double roll feed. The completed caps are automatically ejected from the punches by the positive knockout.

As constructed the press will admit various sizes of punches and dies. It was designed and built by the V &

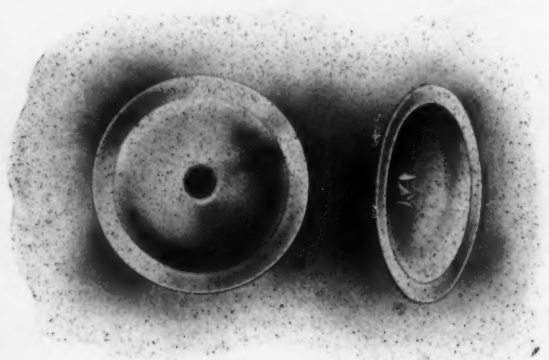


Fig. 2.—Roofing Caps.—Example of the Work Performed by the Press Illustrated in Fig. 1.

O Press Company, manufacturer of presses, dies and special machinery, Glendale, L. I., N. Y.

Signers of the Amalgamated Scale.—The following signatures to the Amalgamated scale are reported by the association's official organ, the *Amalgamated Journal*: American Car & Foundry Company, Detroit, Mich.; Pittsburgh Forge & Iron Company, Pittsburgh, Pa.; A. M. Byers Company, Pittsburgh, Pa.; Brown & Co., Wayne Iron Works, Pittsburgh, Pa.; Cleveland Hardware Company, Cleveland, Ohio; Lockhart Iron & Steel Company, McKees Rocks, Pa.; Colonial Steel Company, Monaca, Pa.; Empire Rolling Mill Company, Cleveland, Ohio; Helmbacher Forge & Rolling Mill Company, Madison, Ill.; Fort Wayne Iron & Steel Company, Fort Wayne, Ind.; Highland Iron & Steel Company, Terre Haute, Ind.; Lake Erie Iron Company, Cleveland, Ohio; Ohio Falls Iron Works, New Albany, Ind.; Sligo Iron & Steel Company, Connellsville, Pa.; Westernman & Co., Lockport, N. Y.; American Rolling Mill Company, Muncie, Ind.; Interstate Iron & Steel Company, East Chicago, Ind.; Ewald Iron Company, Louisville, Ky.; Western Steel Car & Foundry Company, Anniston, Ala.; Kansas City Bolt & Nut Company, Kansas City, Mo.

Three 7500 horse-power Doble tangential water wheels have recently been installed for the California Gas & Electric Corporation, designed to operate at 400 revolutions per minute under a head of 1250 feet. Two 75 horse-power wheels for exciters in the plant of the Pike's Peak Hydro-Electric Railway Company operate under the greatest head of water in the United States, if not in the world—2100 feet.

Chain Making by Electric Welding.

BY ANDRIS-JOCHAMS, BRUSSELS, BELGIUM.

It is only recently that welding by electric current has been employed in chain manufacture. The process first secured recognition in Germany, France, Belgium, Russia, Italy and Sweden before it was experimented with in America. The process with which the present article deals was that evolved after years of experiment by Eugene Francois Giraud of Doulaincourt, France. Claims for the Giraud process are economy, rapidity and su-

periority of production. To contrast this new process with the present manner of producing chain a brief description of the latter will first be given.

at an angle of about 60 degrees with the diameter of the rod. This leaves the ends scarfed and separated about $\frac{1}{2}$ inch, so that the chain may be assembled. The links are then taken to the welding fires.

The furnace in which the chain is welded consists of a box about 31 inches long by 26 inches wide by 12 inches high, made up of cast iron plates bolted together and supported on legs. The box is lined with fire brick except in the center, where the air and gas mix. The top or the box is of fire clay and contains 14 holes, each large enough to admit a link. Two workmen use one furnace, each having an anvil at opposite sides of the furnace. The anvil is grooved to hold a lower die, upon which the

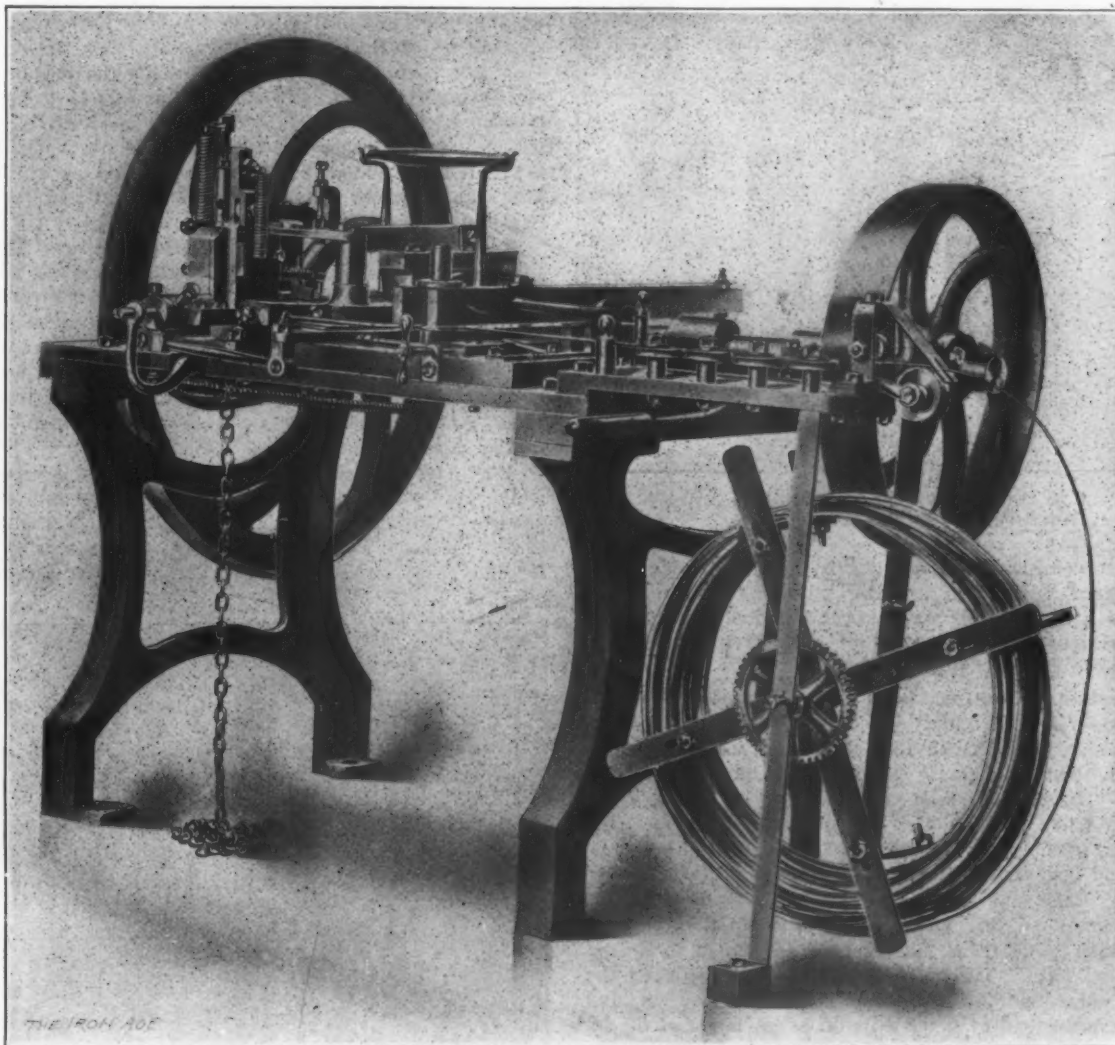


Fig. 1.—A No. 3 Giraud Bending Machine, Capable of Automatically Cutting and Welding 20,000 Links of 9-32-Inch Chain Per Day.

periority of production. To contrast this new process with the present manner of producing chain a brief description of the latter will first be given.

Present Manner of Making Chain on Gas Fires.

In the present process the stock arrives at the plant in coils, which are placed on a reel and wound on a link winding machine into spirals. The link winder comprises a short shaft about 4 feet long driven by a belt and pulley at one end and having a mandrel or link former at the other end. The mandrels are detachable pieces of cast steel shaped to conform with the inside of the required link. The end of the coiled rod being fastened around the mandrel and the winder started, the stock is wound closely into a tight spiral by the pressure of a grooved guide wheel, and when a spiral has been made about 6 feet long the stock is cut from the winder, the spiral is released and is taken to the link cutter to be cut into links.

The link cutter is a power driven machine having two cutting blades, the lower one of which is stationary, while the upper one slides vertically between guides. The spiral is fed into the machine so that the cut is made

link is welded. A hammer arm is hinged to the far side of the anvil and is manipulated by the foot of the workman. The under face of the hammer is grooved to carry the mate to the die in the face of the anvil, and between these two dies the link is welded and finished. Gas at 8 ounces and air at 6 ounces pressure are forced into the center of the forge and ignited, the heat emerging through the holes in the top. Each chain maker has a helper who feeds the links to the machines.

When a link has reached welding heat it is taken from the furnace, hooked through the last completed link and the ends closed together by a few light taps of a hand hammer. The link is then placed on the lower die and finished with the foot power hammer, which completes the weld and finishes off the surface.

Defects of This Method.

Obviously there is a great deal of heat wasted and from the manner in which the links are heated it is reasonable to expect a considerable number of imperfect welds. In point of fact, upon examination of a large number of links in a common chain welded in a gas forge there were less than half of the welds which were perfect.

One of the main reasons for the imperfect welds is the way in which the link is scarfed. The thin part cools more rapidly than does the body of the scarf and loses its welding heat before the weld is made, with the result that the ends of the scarf are not welded, but merely pounded together.

Tests of chains welded at the end of the link show that 75 per cent. or more break at the weld, due to im-

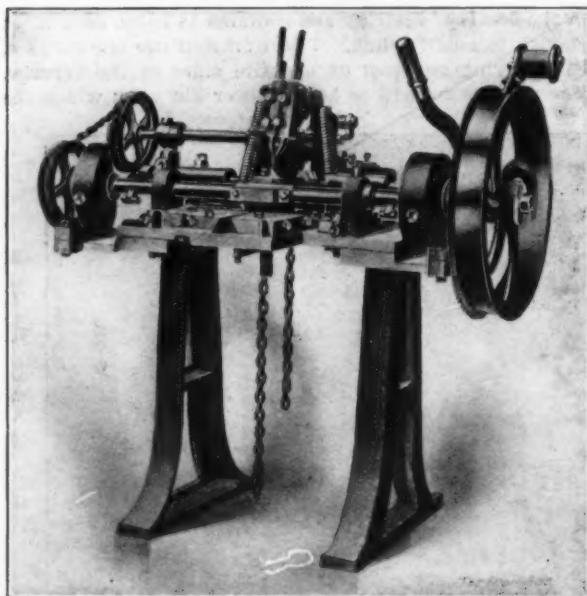


Fig. 2.—A No. 3 Giraud Welding Machine.—Capacity, 4000 Links of 9-32-Inch Chain Per Day.

perfect welding. A perfect link welded at the side where the wear and strain are the least has shown tensile strength equal to 80 per cent. of the double bar of the material used. It is thus that a chain is formed and welded in the Giraud process.

Method of Making Chain by the Giraud Process.

In forming and cutting chain links by the Giraud process only one machine is required, which is shown in Fig. 1. This machine is entirely automatic in its operation. The coil of stock is placed on the reel and the end started through the straightening rolls into the feeding mechanism of the machine, after which it is cut and bent automatically into links of uniform dimensions. Each new length of stock is passed through the last completed link and bent in that position, so that the links issue from the machine assembled in a continuous chain. The weld is made on the side of the link instead of on the end, as in the old process, and the ends instead of being scarfed at an angle of 60 degrees are cut square and left about 1-16 inch apart ready for butt welding.

On the No. 3 bending machine 20,000 links of 9-32-inch stock can be cut and wound in one day, 5 horsepower being required for driving. The links being ready to weld are fed into the welding machine, shown in Fig. 2. The chain is passed through the machine twice, as only alternate links can be welded at each passage without revolving the entire chain 90 degrees about its axis for each succeeding link. In the machine each link to be welded is brought in contact with two electrodes, one on either side of the split in the link, and current is passed until a welding heat is reached. Meantime slides carrying dies adapted to engage the ends of the link press the joint together. After the weld has been effected and while the metal is still hot a spring actuated hammer, having a semicylindrical groove in its face, strikes the link against an anvil with a correspondingly grooved face. This removes the fin formed during welding and finishes the surface. These machines are made both automatic and nonautomatic. The best work is performed on a nonautomatic machine, which may be operated by unskilled labor.

The Advantages of Electric Welding.

The first and most important consideration in any welding process is the certainty of securing a perfect

weld. In the Giraud welders the link is firmly secured in the welding clamps in full view of the operator. As the current is applied the ends of the link may be watched while they come to the proper heat, and the current can be cut off at the right moment. The current is applied just where the ends abut and then the ends are forced together. The moment the two ends touch the current crosses and the resistance of the metal at the point of contact produces the heat necessary in welding. There is no waste heat, as the heating does not commence until the ends are in contact, and when the weld is made the current is cut off.

A link heated in a fire is heated from the exterior inwardly; consequently the outer surface reaches the welding heat first. It is often the case that when the appearance of the link would indicate that the proper heat has been reached it is in reality heated insufficiently in the interior, so that when a weld is attempted it will stick together only on the edges. In electric welding, on the other hand, the heat is developed first in the interior and makes its way out, so that when the usual white sparks are emitted it is known that the entire joint is heated to the welding heat.

The heated portion of the link to be welded is not exposed to the air, as in the fire welding process where oxidizing occurs, forming scale that often prevents a perfect weld. The act of forcing the abutting ends together in electric welding causes the current to flow, rapidly bringing the ends to the welding heat. There is no noise, no dirt, no intense heat to contend with, no waste due to overheated or imperfectly welded links and no dependence on skilled labor.

With electric welding perfect homogeneity is secured, which may not be said of welds secured by any other process. Tests show that the conductivity of the weld is just the same as that of the body of the material and in some cases actually higher. The molecular structure

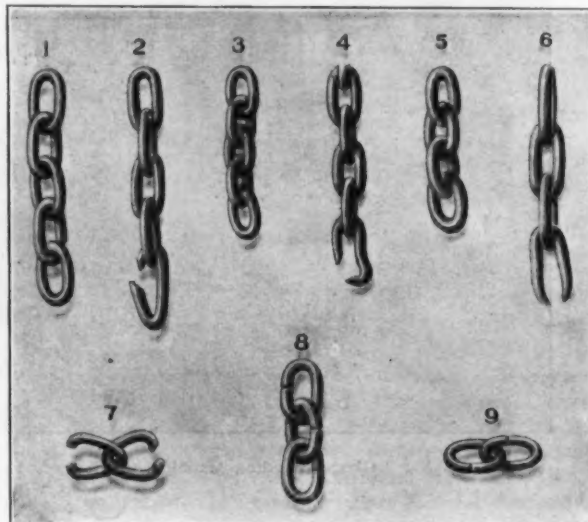


Fig. 3.—Examples of Chain Before and After Breaking and Manner of Assembling by the Old and the New Processes.

of the welded part is exactly the same as the rest in the case of electrically welded steel, while in electrically welded iron the fiber and structure are as perfect as before the weld is made. There is no danger to the operator in handling the welding machine, for though the quantity of the current used is large the potential at which it is applied is very low and the welding terminals of the machine may be touched without injury.

The writer has had compiled a number of tables showing the comparative costs of manufacture of different grades of chain by both the gas and the electric welding process, and is indebted to M. Giraud for the accompanying illustrations of the welder and bender and the data in tables I and V. The data in the other tables and much of that in the article were obtained from prominent chain manufacturers in the United States who are now preparing to manufacture chain by electric welding.

Comparisons of Cost.

There are several fixed costs in chain manufacture, including cost of material, cost of welding and cost of fuel. Cost of material depends on the market price of rods, which at the present time is about \$36 per gross ton, or \$1.60 per 100 pounds. The item of 10 per cent. waste (tables II, III and IV) covers the average waste of material in winding, cutting and welding. In the new process there is practically no waste, owing to the improved method of winding and cutting and the welding by electric current. The item of cost of welding is a fixed price per 100 pounds, determined by the Chain Makers' Union. For the smaller sizes of chains the price

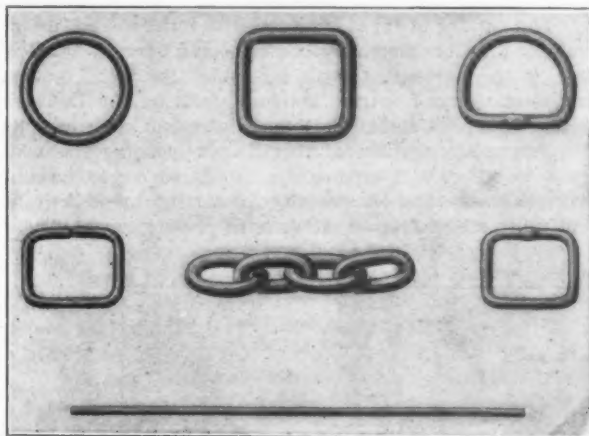


Fig. 4.—Miscellaneous Welds in Different Shapes Made by the Giraud Welders.

is fixed so that the workmen may easily make from \$2.50 to \$3 per day, while on the larger sizes requiring more exertion in handling a higher daily wage is averaged.

The item of fuel depends on the cost of coke, gas or oil, that for coke being lower than that for gas, although lower daily average production results, while oil is slightly more expensive than gas. A double gas fire burns about 6000 cubic feet of gas per day, which, at 15 cents per thousand, makes the average daily expense per fire 45 cents.

The item of daily expense will vary according to the size of the plant and its daily production and is intended to cover all expenses not otherwise included in the cost estimate, as, for example, all expense of handling material, testing chain, running the plant, providing power for operating hammers, winders, cutters and blast fan; office expenses, such as salaries, advertising, all selling expenses, repairs to machinery, taxes, interest on investments, &c. It is commonly assumed to be one-half of the daily welding cost, therefore varies with the size of chain figured on. In the examples given in tables II, III and IV it averages about \$1.40 per day, but on large sizes of chain, where the welding cost is from \$5 to \$10 per day, the allowance for expense will be greater.

Assuming the expense in operating an electric welding plant for the manufacture of chain on the same basis—namely, one-half of the daily welding cost—a comparison of the estimated costs of production of the three grades of chain—common, steel loading and block chain—on gas fires with that of the same size chain made by the Giraud process will show a decided advantage in favor of the latter.

Table II.—Cost of Making 9-32-Inch Common Chain on Gas Fire.

Daily average welded, in links.....	2,800
Daily average welded, in feet.....	233
Daily average welded, in pounds.....	175
Cost of material, 175 pounds at \$1.60 per 100 pounds.....	\$2.80
10 per cent. waste in winding, cutting and welding.....	\$0.28
Cost of welding at \$1.65 per 100 pounds.....	\$2.89
Cost of fuel, 3,000 feet of gas at 15 cents per 1,000 feet.....	\$0.45
Daily expense (50 per cent. of welding cost).....	\$1.45
Total.....	\$7.87
Cost per 100 pounds.....	\$4.50
Cost per 100 feet.....	\$3.87

Table III.—Cost of Making 9-32-Inch Steel Loading Chain on Gas Fire.

Daily average welded, in links.....	900
Daily average welded, in feet.....	80
Daily average welded, in pounds.....	60
Cost of material, 60 pounds at \$1.60 per 100 pounds.....	\$0.96
10 per cent. waste in winding, cutting and welding.....	\$0.096
Cost of welding, at \$4.63 per 100 pounds.....	\$2.778
Cost of fuel, 3,000 feet of gas at 15 cents per 1,000 feet.....	\$0.45
Daily expense (50 per cent. of welding cost).....	\$1.389
Total.....	\$5.673
Cost per 100 pounds.....	\$9.45
Cost per 100 feet.....	\$7.10

Table IV.—Cost of Making 9-32-Inch Block or Wheel Chain on Gas Fire.

Daily average welded, in links.....	840
Daily average welded, in feet.....	70
Daily average welded, in pounds.....	56
Cost of material, 56 pounds at \$1.60 per 100 pounds.....	\$0.896
10 per cent. waste in winding, cutting and welding.....	\$0.089
Cost of welding, at \$3.85 per 100 feet.....	\$2.695
Cost of fuel, 3,000 feet of gas at 15 cents per 1,000 feet.....	\$0.45
Daily expense (50 per cent. of welding cost).....	\$0.1347
Total.....	\$5.477
Cost per 100 pounds.....	\$9.78
Cost per 100 feet.....	\$7.82

Table V.—Cost of Making 9-32-Inch Chain on the Giraud Machines.

Daily average welded, in links.....	4,000
Daily average welded, in feet.....	333
Daily average welded, in pounds.....	263
Cost of materials, 263 pounds at \$1.60 per 100 pounds.....	\$4.208
Practically no waste in this process.	
Cost of welding, at \$1.50 per day for unskilled labor.....	\$1.50
Cost of current, 40,000 watt hours at 5 cents per 1,000.....	\$2.00
Daily expense (50 per cent. of welding cost).....	\$0.75
Total.....	\$8.458
Cost per 100 pounds.....	\$3.21
Cost per 100 feet.....	\$2.54

Quality of Production.

The most important item next to the cost of production is quality of production, and in this also the electrically welded chain has many points of superiority. To show the actual tensile strength of an electrically welded chain the writer secured six pieces of 9-32-inch chain, two of common quality, two of steel loading quality (supposed to be the strongest possible chain) and two made by the Giraud process. One of each of these was broken and the results are shown in Fig. 3.

Nos. 1 and 2 show 9-32-inch common chain before and after breaking. This sample broke at 2200 pounds and stretched about 8 per cent. The break occurred at one of the quarters of the weld and is a striking indication of the imperfection of the welds in common chain.

Nos. 3 and 4 show samples of 9-32-inch steel loading chain, which is sold at a high price and is used for logging purposes, &c., where a chain of high tensile strength is demanded. This chain was purposely made heavier in the weld in an endeavor to strengthen the acknowledged weakest point. No. 3 shows the regular shape and length of piece, from which it will be noticed the links are very short. This accounts in part for the high cost of

Table I.

Designation of the types of the machines.	Kind of chains to be produced. Inch.	Production of links.		Diameter of links. Inch.	Examples.—Daily production.				Horse-power required.	Workmen needed for the operation of these machines.
		Per minute.	Per day.		In links.	In feet.	In weight. Pounds.			
Bending machines:										
No. 1.....	$\frac{1}{16}$ to $\frac{5}{32}$	50	30,000	$\frac{7}{32}$	30,000	2,000	200	$1\frac{1}{2}$	One workman for four machines.	
No. 2.....	$\frac{5}{32}$ to $\frac{9}{32}$	40	24,000	$\frac{7}{32}$	24,000	1,800	900	3		
No. 3.....	$\frac{9}{32}$ to $\frac{15}{32}$	33	20,000	$\frac{11}{32}$	20,000	1,600	2,500	5		
No. 4.....	$\frac{15}{32}$ to $\frac{15}{16}$	20	12,000	$\frac{7}{16}$	12,000	1,400	3,000	$6\frac{1}{2}$		
No. 5.....	$\frac{15}{32}$ to $\frac{5}{8}$	15	9,000	$\frac{19}{32}$	9,000	1,200	4,000	9		
Welders:										
No. 1.....	$\frac{1}{16}$ to $\frac{5}{32}$	12.5	7,500	$\frac{7}{32}$	7,500	500	50	$\frac{1}{2}$	Varying according to the diameter to be welded. 86 watts needed to square millimeter of material welded.	One boy for each welder.
No. 2.....	$\frac{5}{32}$ to $\frac{9}{32}$	10	6,000	$\frac{7}{32}$	6,000	450	225			
No. 3.....	$\frac{9}{32}$ to $\frac{15}{32}$	7	4,000	$\frac{11}{32}$	4,000	400	500			
No. 4.....	$\frac{15}{32}$ to $\frac{15}{16}$	5	3,000	$\frac{7}{16}$	3,000	350	750			
No. 5.....	$\frac{15}{32}$ to $\frac{5}{8}$	4	2,400	$\frac{19}{32}$	2,400	300	1,000			

welding, as the chain maker has to weld more links to make 100 pounds of steel loading chain than he does to make the same weight of common and longer link chain. No. 4 broke at 5500 pounds and was elongated about 25 per cent.

Nos. 5 and 6 show samples of 9-32-inch chain made by the Giraud process. Sample 6 broke at a strain of 7000 pounds and showed an elongation of about 40 per cent. This tensile strength is probably the highest ever given by a 9-32-inch chain, in spite of the fact that it was of ordinary material with no especial precautions taken in its manufacture. From No. 6 it can easily be seen that the point of greatest strain and wear and therefore the weakest point of a link is on the end. The weld in this sample is on the side of the link, which shows from the way the break occurred that the weld made electrically is quite as strong as the rest of the link. In this case the material itself pulled out to a thread at one end, while the weld in each link is perfect.

No. 7, in Fig. 3, shows the way the links are wound and cut under the old process, and Nos. 8 and 9 the way of forming the links on the Giraud machine.

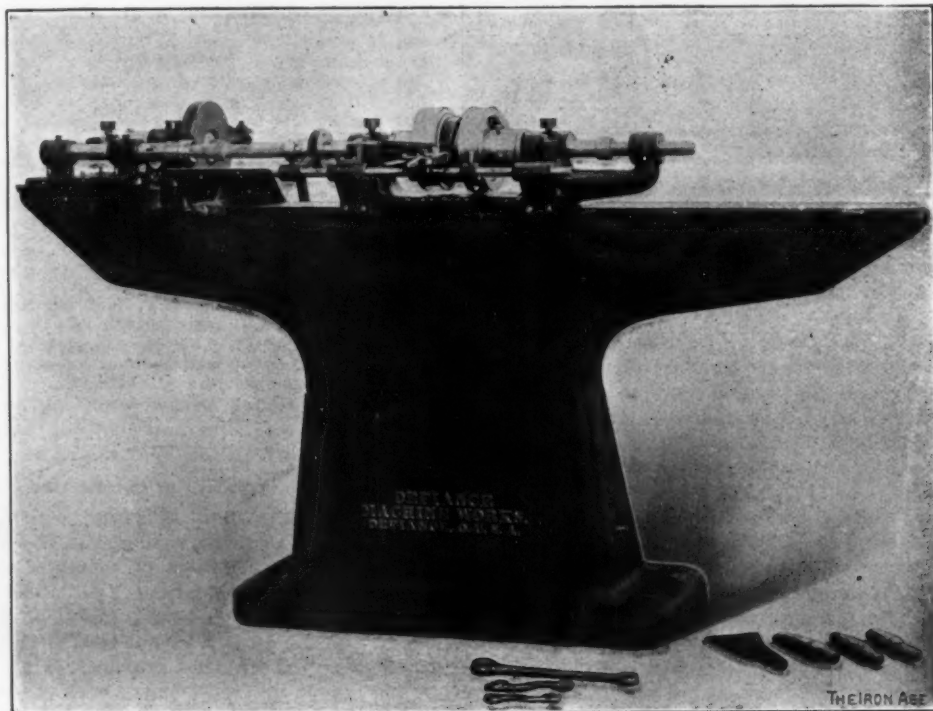
Owing to the improved machinery used and to the method of welding chain by the Giraud process each link

the machines can form and weld any shape coming within the range of the machine.

The chain making industry in the United States represents an immense investment in improved machinery and processes. The average annual production of welded chain in this country is at least 50,000 tons. The adoption of the electric welding process would mean the dismantling of over 20 large modern chain shops and might result in the concentration of the production into fewer shops.

The Defiance Automatic Wood Threading Machine.

The cutting of threads on wooden articles, such as insulator pins, brackets, spools and bobbin barrels, handles, &c., is the particular work for which the No. 1 patent automatic thread cutting machine, built by the Defiance Machine Works, Defiance, Ohio, is intended. It is capable of cutting any number of threads per inch for distances of 3 inches or less on material up to 42 inches long of various diameters. A smooth, clean, true thread may be cut up to a shoulder on either hard or soft wood. About



The No. 1 Automatic Thread Cutting Machine for Wood, Built by the Defiance Machine Works, Defiance, Ohio.

is exactly like its adjoining link in width, length and shape. This is a point of important commercial value, for in making chain by any other process the various steps in production are accomplished in such a manner that absolute uniformity in dimensions of the links cannot be obtained. For example, when the chain maker is welding the ends of the links together he probably laps one scarf over the other farther in one link than he will in the next, and so on. As a result, unless a chain is especially made for and fitted to a sprocket wheel or chain block it could not be used on either. On the other hand, the chain made by the Giraud machines is absolutely uniform in every respect, so that the chain thus made may be used either for selling for common quality or for block chain.

To show the comparative cost of manufacture tables II, III, IV and V are given, from which it will be seen that chain may be made by the Giraud process at a cost to successfully compete with chain made in any quality by any other process.

The Giraud bending and welding machines are not limited to the making of chain, but can be used for forming and welding many miscellaneous shapes, such as those shown in Fig. 4. By making slight changes in the tools

18,000 pieces may be handled in a working day of ten hours.

One of the most important features of the machine is the use of a saw cutter in place of the stationary cutter such as is usually found on machines of this kind. The stationary cutter has the disadvantage of leaving the work rough, whereas the saw cutter, having a great many cutting edges, so that each one has but a small amount of work to do, will cut accurate clean threads at a high rate of speed without tearing. The table which supports this cutter is so arranged that it can be set for cutting either a straight or tapered thread.

The piece to be threaded is placed between cup or cone centers, depending upon the nature of the work, and is accurately centered without any special attention on the part of the operator. A slight pressure on a spring lever causes the work to be fed forward to the cutter and back when the thread is completed, the piece being automatically discharged. Automatic stops attached to the tail stock determine the length of thread to be cut and are quickly adjustable. For different lengths of stock the entire tail stock may be adjusted horizontally. For threading duplex or double ended insulator pins with a thread at each end, of different lengths, say one 1½ inches long

and the other 2 inches, the machine is so arranged that both ends may be cut without any change of adjustment. After cutting one thread the pin is reversed in the machine for the other operation.

In the feeding for the thread cutting the work is advanced instead of the cutter, as may be seen from the engraving. A master screw is used, which is placed on the end of the spindle supported by the tail stock. This screw can be quickly changed for one of different pitch when a different number of threads per inch is required.

The machine is made in sizes to accommodate material from 2 inches up to 6 feet in length. One of these machines was recently furnished to the General Electric Company for cutting V-threads on wood, which is considered a difficult operation. The machine is stated to have performed the work with entire satisfaction.

Minnesota to Contest Ownership of Ore Lands.

DULUTH, MINN., July 7, 1905.—A far reaching and drastic step mentioned as a possibility in one of these letters some months ago has now been announced as to be attempted. This is no less than a suit by the State of Minnesota to test the constitutionality of the law under which State mineral leases have been taken. If successful it will have the effect of abrogating all these leases and of turning back to the State the 75,000,000 or more tons of iron ore which the State leased lands are now known to contain.

The grounds for such an attempt were set forth in the first mention of this matter. Briefly, they hinge upon the meaning of the word "land" and whether or not it applies to iron ore therein. The constitution of Minnesota distinctly states that no public lands shall be sold except at public sale, and mineral leases have never been sold at public sale except where there have been simultaneous applications for individual tracts. The law under which these leases have been taken was passed in 1889 and provided for the issuance of a mineral lease, or subsequent 50-year contract, upon application of the first comer who paid the requisite fee, which is \$25 in the case of lease, \$100 in that of contract. If the leasing of State land for the purpose of taking away iron ore is a sale of the land, then the constitution has been violated upon every lease ever taken.

Of course the courts are not going to abrogate rights of innocent purchasers who have complied with the State's law as the State has interpreted it, unless it is absolutely necessary, and there is sure to be a lively fight over the matter. As intimated above, there are, say, 75,000,000 tons of ore shown on State lands. The chief holdings are those of the United States Steel Corporation, whose principal leaseholds are the Oliver and Minnewas, the Leonidas and Pool, the Carson and Wanless, 5-57-20 and some smaller tracts in 59-14. The Lackawanna Steel Company has 14,000,000 tons in the Scranton, in 57-21; the Jones & Laughlin Steel Company nearly as much in the Grant, in 58-19; M. A. Hanna & Co. a few millions in the Frantz and Yates; the Pitt Iron Company a few millions in the Wauconda, in 58-18, and the Lake Superior Corporation the same in the Woodbridge, in 58-19. These are the chief State leased ore tracts, though there are many other tracts held by mining companies under option for purchase from prior holders contingent upon the discovery of ore, and many more held for speculation by individuals. Should the State win in such a contention and secure the tonnage of its mines, already proved up by present holders, it could dispose of them at high figures. Indeed, it is reasonable to suppose that these leases would be worth not less than \$8,000,000 to \$10,000,000 in due time, above the 25 cents a ton royalty they now draw.

D. E. W.

Breaking Records at the Pencoyd Iron Works.—At the Pencoyd Iron Works, Philadelphia, in the first half of June, 7633 gross tons were charged in the 23-28 inch mill and rolled into beams, channels and angles. This is the best record in the history of the works. In 11 hours 396 tons of 6 x 6 inch angles were rolled; changed the mill in 1 hour and 10 minutes from rolling 12-inch channels to 6 x 6 inch angles.

The Diamond Steel Duty.

After a lapse of eight years the Treasury Department has served official notice on officers of customs that the classification of diamond steel is again to be a subject of litigation. The steel in question consists of fine granules used for the purpose of cutting stone. It seems that the proper classification of diamond steel was settled by the United States Circuit Court of Appeals in 1897. At that time, however, the Wilson tariff law was in force. The court held that diamond steel was dutiable at the specific rates provided in the former tariff act for "steel in all forms and shapes." The Government's contention was that the article is a "manufacture of steel," and therefore subject to assessment at the rate of 45 per cent. ad valorem. It was finally decided to acquiesce in the finding of the court, and from that time to the present it has been the practice of the Government to return for duty importations of diamond steel at the rates provided for "steel in all forms and shapes." Precisely what has influenced the Treasury Department at this time to renew litigation is not revealed. Officers of the customs at New York stating that all they know about the matter is contained in the official instructions to the local collector of customs to hereafter classify diamond steel under the provision in the Dingley tariff act for "manufactures of steel." It is assumed by the Treasury officials at Washington that the attempt of the Government to collect a 45 per cent. duty on the steel will result in a protest being filed by importers with the Board of Appraisers, and that in this way the issue can be brought into the Federal courts. Until the forthcoming test case is decided the authorities will no longer return the diamond steel at the specific rates provided for "steel in all forms and shapes." On the contrary, the article will be assessed on the basis of 45 per cent. One version of the Treasury's action is that foreign competition with the domestic product is responsible for the latest litigation.

The Steel Wool Duty.

Notwithstanding that the Board of United States General Appraisers and the Federal Circuit Court have agreed that steel wool is dutiable at the rates provided in the existing tariff law for "steel in all forms and shapes" the Treasury Department has asked the Circuit Court of Appeals at its next session to review the action of the lower tribunals. The Government will insist that steel wool is properly dutiable at the rate of 45 per cent. ad valorem under the provision in the tariff law for wares composed of iron or steel, as specified in paragraph 193. When the case comes up in court the importer, the Buehne Steel Wool Company, will contend that if the article is not properly classified, as found by the board and the Circuit Court, it is subject to duty at the rates provided for manufactures of steel wire.

The British firm of Babcock & Wilcox, which is separate and distinct from the American company, has issued a circular to its shareholders proposing to modify the reserve fund and capital account of the company. The circular states that as the extension of the business requires employment of increased working capital, and as the reserve fund has accumulated to an amount that admits of it, the company is glad to be able to place before the shareholders the means of readjusting the capital and reserve fund accounts by making a distribution out of the reserve fund of £265,000 at the rate of 10 shillings per share to the holders of ordinary shares.

A hydro-electric power plant is to be erected at Taylor's Falls, on the St. Croix River, 45 miles north of Minneapolis. It will contain eight Victor turbines of 4200 horse-power each, operating at 277 revolutions per minute under a head of 55 feet. The penstocks, which will be constructed of riveted steel, will have a mean diameter of 14 feet. The contract calls for the completion of four of the units by the end of the year, while the other four are to be in place early in 1906. The current will be transmitted to Minneapolis, where it will be used largely for lighting purposes. The total power to be developed is 33,600 horse-power.

Large German Gas Engines.*—III.

The Nuremburg Double Acting Four-Cycle Gas Engines.

Nearly all the points described above as essential have been taken care of in the construction of this

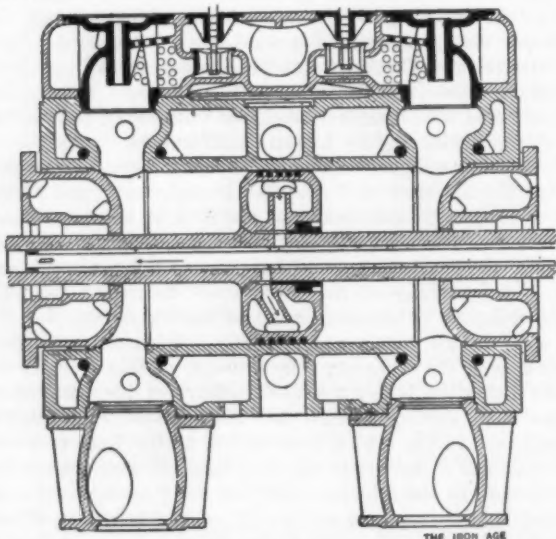


Fig. 14.—Double Acting Four-Cycle Cylinder (Nuremburg).
engine, and the four-cycle system is thereby freed for the first time from the inherited faulty details of small

cylinders in tandem, as shown in Fig. 15, or for very large powers, as tandem duplex.

3. To construct cylinders with detachable heads and to design other parts along the line of the modern steam engine, so that all are connected with the engine frame by means of central flange connections only, in order to facilitate accurate and easy erection. Fig. 15.

4. To make the piston narrow and well cooled, as shown in Fig. 14, and to support it by means of the piston rod.

5. To arrange all the cylinder heads so that they can be taken off without removing other parts, as shown in Fig. 15.

6. To insure trustworthy water cooling for the piston and piston head, and by means of metallic packing to insure the tightness of the latter. Fig. 18.

7. To construct the valve mechanism along the lines of that used for steam engines, as shown in Fig. 16, thereby avoiding heavy moving parts, &c.

8. To construct the working parts of the engine so as to take care of the forces in the surest manner possible.

The most important parts of the Nuremburg engine are the cylinder, the operating valves and the piston with its head, water cooling and packing. Different from the methods formerly used, the cylinder, as shown in Fig. 14, is fitted with a head which does not contain any valves and is at both ends easily accessible and removable, while the valve boxes, as in steam engines, are connected with the cylinder at both ends. The cylin-

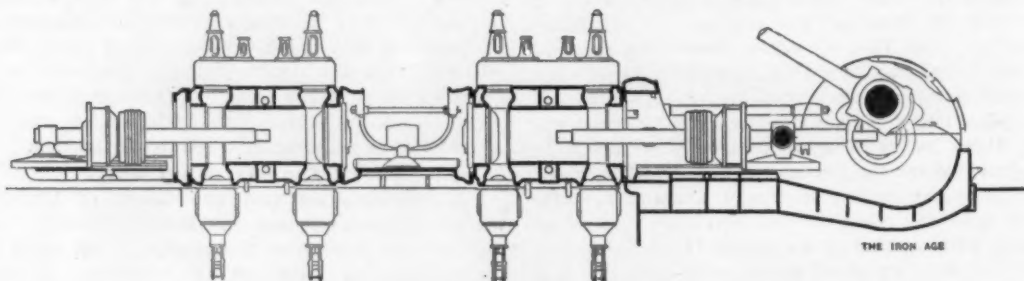


Fig. 15.—Double Acting Tandem Four-Cycle Gas Engine (Nuremburg).

gas engines. The principal ideas followed in its construction are as follows:

1. To construct a four-cycle engine with double act-

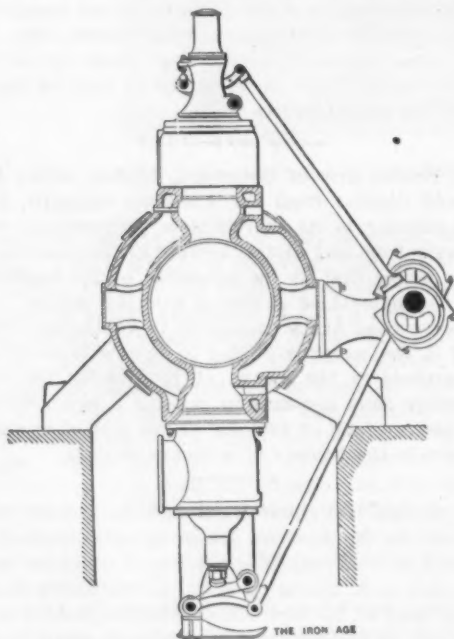


Fig. 16.—Cross Section of Cylinder.

ing cylinder, as shown in Fig. 14, and thereby obtain a high mechanical efficiency.

2. To build large engines with two double acting

der and jacket form one casting, and there is a large distance piece between the two cylinders. This adds to the strength and reliability of the cylinder, makes it sufficiently independent of changes of temperature and gives the necessary accessibility. The ribs connecting the cylinder and jacket are thick, so that they are subject to but small strain in consequence of the expansion of the former, while there is sufficient space to permit the use of a large core in the foundry, thus insuring a casting free from internal strain, which is a distinct advance over the usual practice. The wide space also insures better water cooling and is made accessible by means of a plate for inspection and cleaning.

The arrangement of the double acting cylinders in tandem and their connection with each other is shown

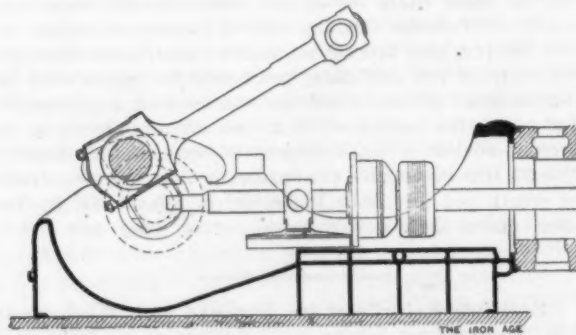


Fig. 17.—Accessibility of Forward Side of Cylinders.

in Fig. 21 *et seq.* The working stresses and strains are taking up by direct connection of all parts, so that the foundation has only to support the weight and prevent the small amount of axial movement, for which purpose

* Continued from page 2050 of issue of June 29.

either the cylinders or the casting between them has feet, which rest on the foundation plates, as shown in Fig. 24.

The accessibility of the cylinders and heads is shown in Fig. 22. For the purpose of inspection, &c., it is only necessary to slide the same along the piston rod, which can be quickly accomplished without help from the

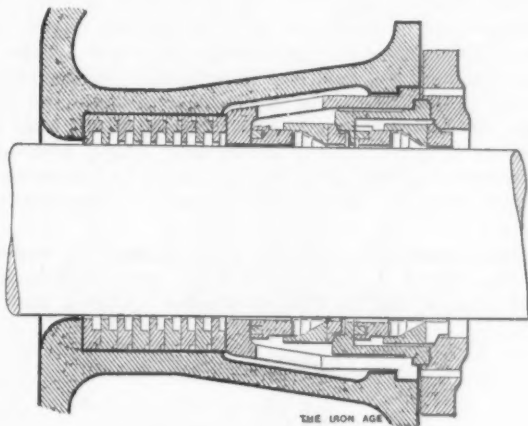


Fig. 18.—Metal Packing Box.

crane. In order that the front cylinder may be equally accessible the middle piece and the two cross head bolts and a special shoe are so built that the piston rod is carried by inserted steel rings. This construction permits the external piston rod screw to be loosened and the cross head with sliding shoe moved out of the way.

If the rod is disconnected and raised by the crane, as shown in Fig. 17, the various parts—i. e., cross head, cylinder head, piston and piston rod—can be drawn toward the front and any necessary work performed conveniently. When the cylinder heads are drawn out the

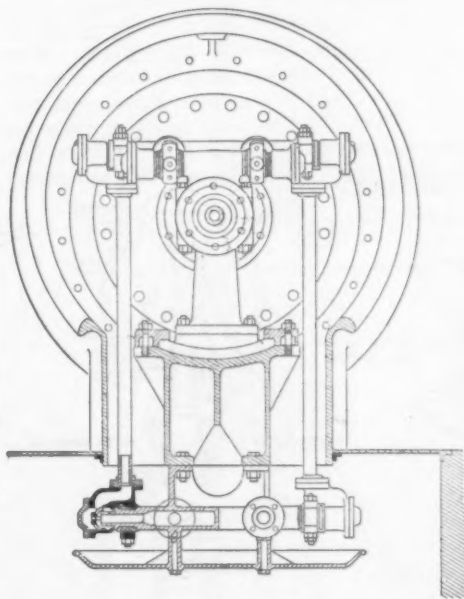


Fig. 20.—Supply of Cooling Water Through Jointed Pipes.

exhaust valve and seat can be inspected and cleaned. This arrangement disposes of the frequent objections raised against exhaust valves, which, however, only apply to former constructions, as shown in Figs. 2 and 3.* The piston can be carried in the cylinder by means of the piston rods, with no other friction than that occasioned by the pressure of the packing rings. This is a matter which is quite important in large steam engines, but in large gas engines it is a matter of life and death, as in the latter case a certain amount of dirt in the cylinder is inevitable.

* These illustrations appeared in the installment printed in *The Iron Age* June 22.

In all former engines the piston had to carry its own weight, whereby its working surface was burdened not only with the weight of the piston but, in earlier machines, with the pressure of the cross head also, another inheritance from the days of small engines. The packing of the piston rod has been carried out by means of inserting in the water cooled cylinder head a stuffing box for metallic packing, as shown in Fig. 18. Cooling of the piston can be effected by means of a hollow piston rod. The water is supplied either from an elevated tank or

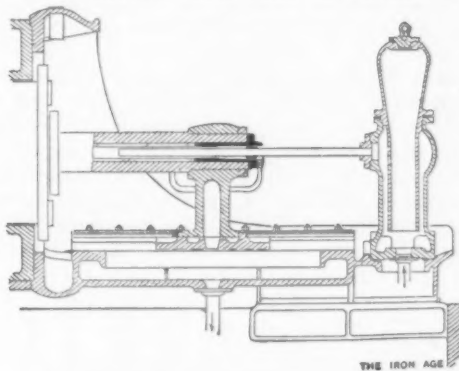
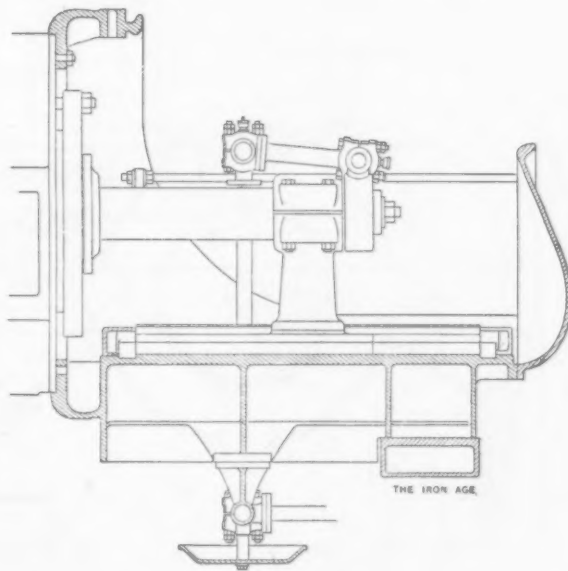


Fig. 19.—Supply of Cooling Water Through Rear Piston Rod (Engine Plant at Mischeville).

by means of a pump, through a fixed tube, as shown in Fig. 19, or through swinging joints, as shown in Fig. 20.

The arrangement of the valves and spindles and their connection with the valve boxes are shown in Fig. 22 for the exhaust valve, Fig. 23 for the inlet valve and also Fig. 27. The details of the cooling arrangements are of the greatest importance, as any failure in that direction leads to defective working.

The valve mechanism of the Nuremberg gas engine is shown in Figs. 24 and 25. Its most important points are the side shaft, extending from end to end of the en-



gine; the eccentrics, with large working surfaces instead of the small cams generally employed; the eccentric rods instead of the long, heavy levers; the rolling levers, shown in Fig. 23, and the decreased weight of the moving parts. Other details of the Nuremberg gas engine are shown in Fig. 27.

All the above principles are a departure from those used in small engines, but are in harmony with modern steam engine practice. The length of all tandem machines is necessarily great and should not be diminished by leaving out the distance pieces between the cylinders. If the necessary space is not available the engine should be built in duplex form. The length of engines built with

cylinders in tandem is not, however, greater than that of two-cycle engines with double acting pistons, if the necessary pumps for the latter are driven direct. This question of length may become inconvenient if blowing tubs are to be connected with tandem gas engines, as shown in Fig. 26, which represents the blowing engine of the Rombach Works. This is an engine of about 900 horsepower, capable of compressing about 30,000 cubic feet of air a minute at 80 revolutions and 7 pounds pressure. If it were necessary to limit the length the blowing tubs could be arranged vertically over the crank.

(To be continued.)

British Workmen and Pneumatic Tools.—A Glasgow correspondent of the *London Times* says that the use of pneumatic riveting tools, against which workmen in the shipyards at Scotland had arrayed themselves, is extending in spite of all opposition. Much objection had been made by the men to the vibration of the tools in working and the effect of this on the operator's nerves. In view of the improvements recently made, however, the

Tariff Changes in the Dominion.

Toronto, July 8, 1905.—In his budget speech on Thursday, July 6, the Finance Minister sprang few surprises. For his most important announcement—that relating to the appointment of a Tariff Commission—he had prepared the country in his fiscal message of last year. The public would probably not have been much disappointed had all changes in the duties been deferred until action could be taken on the commission's report. But Mr. Fielding thought that in regard to a few articles the Government had sufficient information to warrant it taking action now. The articles in question are called cats, dry white lead, ground white lead in oil, bags containing cement, South African light wines, beet sugar machinery, alluvial gold mining machinery, molasses imported from the British West Indies on Newfoundland vessels.

The Commission and the Lines of the New Tariff.

The Tariff Commission's work, Mr. Fielding said, will be concluded in time if possible to bring the com-

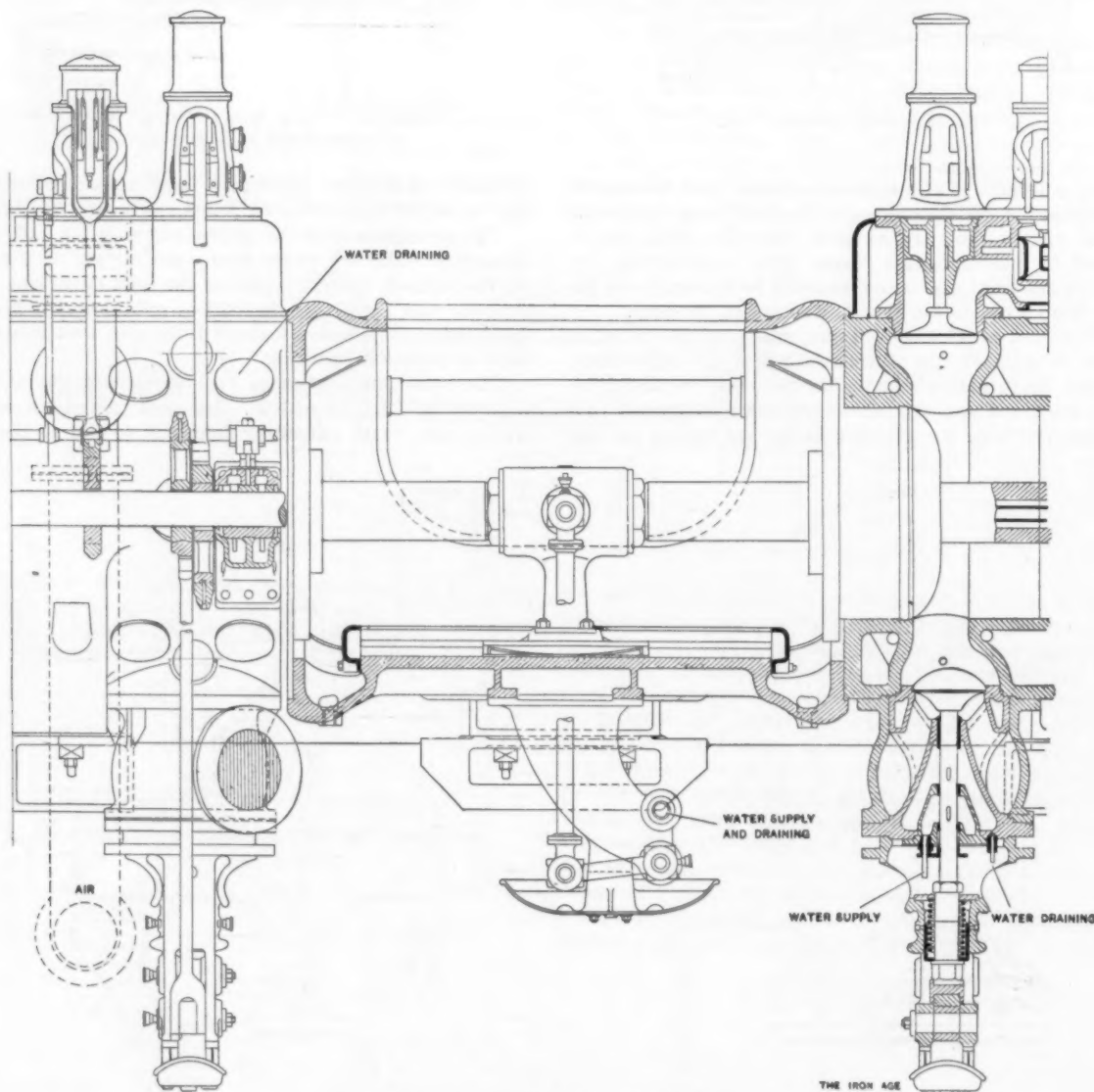


Fig. 21.—Connection of Two Cylinders.

correspondent says there is now no reasonable ground for objection to pneumatic power hammers for riveting and much less to their use for chipping and calking. The strike of a year ago was on the ground of "harmfulness to the nervous system." More recently the same class of workmen struck against allowing apprentices and "mere laborers" to work pneumatic tools to the detriment of skilled artisans. It is expected that a conference of shipbuilding, boiler making, bridge building and large employers will be held in Edinburgh to arrange scales of prices for the general use of pneumatic tools to their full capacity by classes of skilled workmen who seem to feel that their handicraft is in danger.

plete scheme of revision before the next session of Parliament, beginning in February or March. Mr. Fielding no doubt will be chairman of the commission. Mr. Paterson, the Minister of Customs, will be a member. Sir Richard Cartwright, as Minister of Trade and Commerce, should also be a member. This was the personnel of the commission of 1897. There is doubt about Sir Richard Cartwright this time. He might find the labors of an itinerant commission too much for the present state of his health. Moreover, he is now in the Senate, and Ministers who take part in the inquiry ought to be in the House, which is the source of all revenue legislation, there to answer for their scheme of revision. It is probable,

therefore, that another member of the Administration will join Mr. Fielding and Mr. Paterson.

Mr. Fielding repeated what he said last year as to the lines of the new tariff. A set of maximum duties will be

Dry White Lead and Portland Cement.

On dry white lead the duty has been advanced from a rate of 5 per cent. ad valorem to one of 30 per cent. ad valorem. The Minister explained that when the former

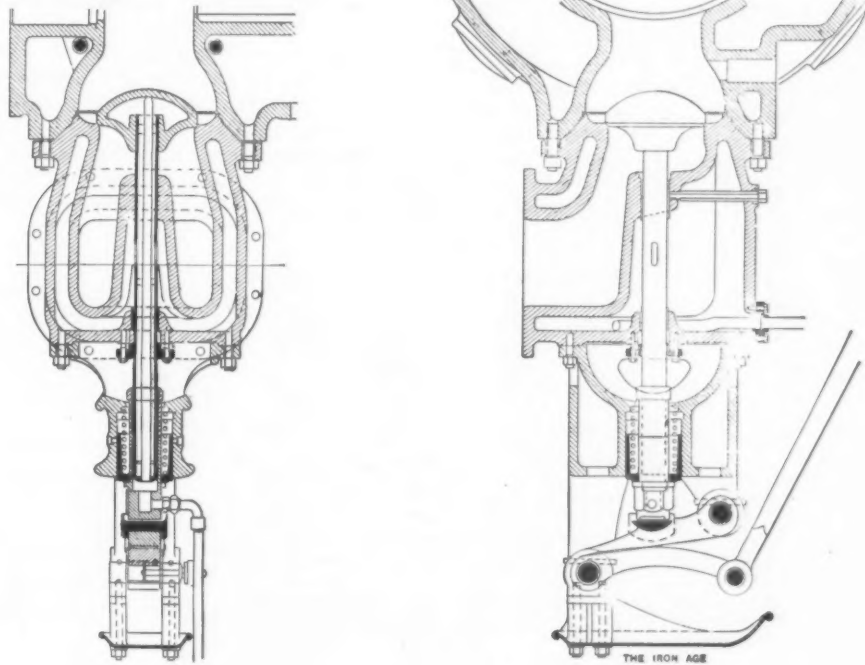


Fig. 22.—Arrangement and Cooling of Exhaust Valve.

applied to countries whose duties on Canadian articles appear to be excessive or imposed in hostility. To-day the surtax on German goods is an application of the maximum tariff principle. Next in Mr. Fielding's new order will be his set of minimum general duties, applicable to the products of countries showing a disposition to trade with Canada. Lowest of all will be the preferential duties, limited to goods coming from the United Kingdom and from such countries of the British Empire as the Government deems it expedient to favor. Of course there will still be the free list. Thus retaliation, reciprocity, preference and free trade will each have a part in the

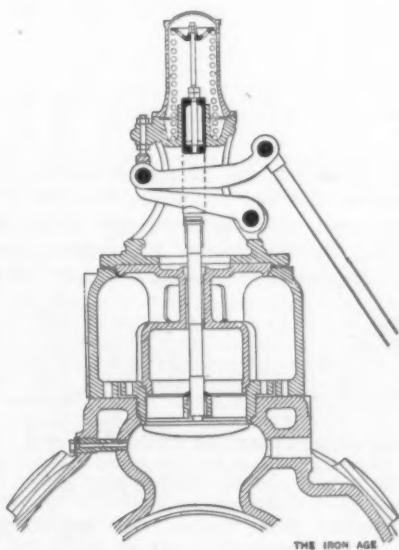


Fig. 23.—Arrangement of Inlet Valves.

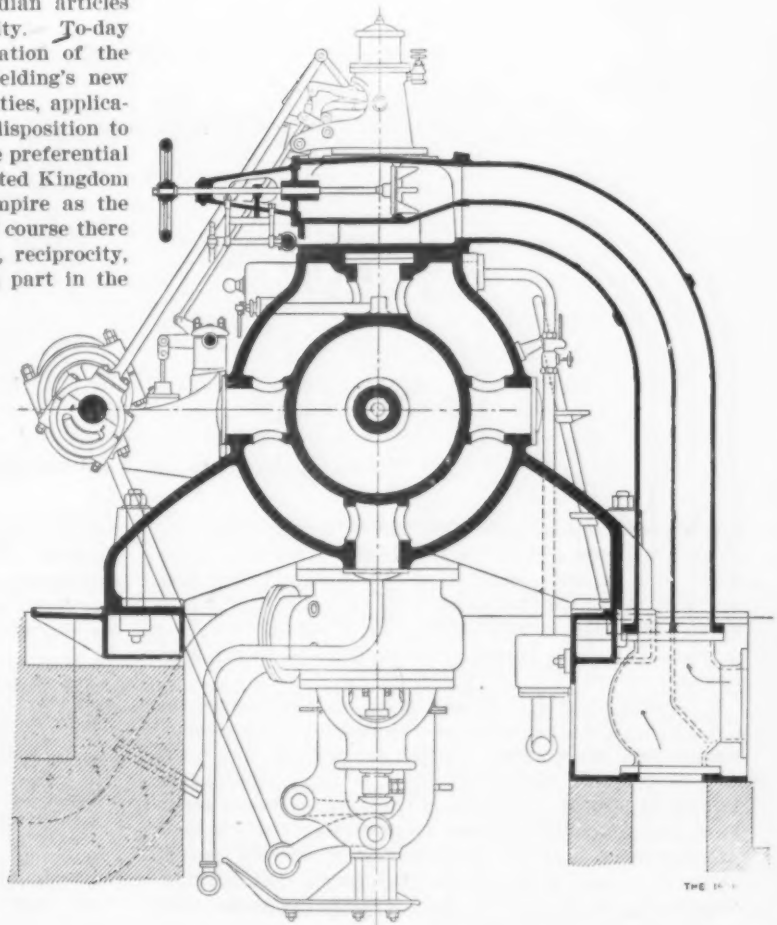


Fig. 24.—Valve Mechanism and Section of Cylinder of the Four-Cycle Gas Engine.

new scheme. The plan appears to be conceived largely with relation to other countries. Its bearing on Canada either for revenue or protection was not discussed by the Minister.

rate was established, many years ago, there were no works in Canada producing dry white lead. There have now been established in Montreal very large works for its manufacture. Consequently he advanced the rate to 30

per cent. Another condition necessary for the existence of a lead corroding industry in Canada—namely, an adequate supply of pig lead—has been realized as a result of the Government's lead bounty. Canada has abundance of good lead ore in southern British Columbia. Development of these deposits and the smelting and refining of their ores were accelerated by the bounty on the metal.

operations on the new Transcontinental Railway have begun to be prepared for.

Sugar making plant and machinery required in alluvial gold mining have had their exemption from duty renewed for another year, that ending with next June.

Deporting American Silver.

From time to time an agitation has been started to

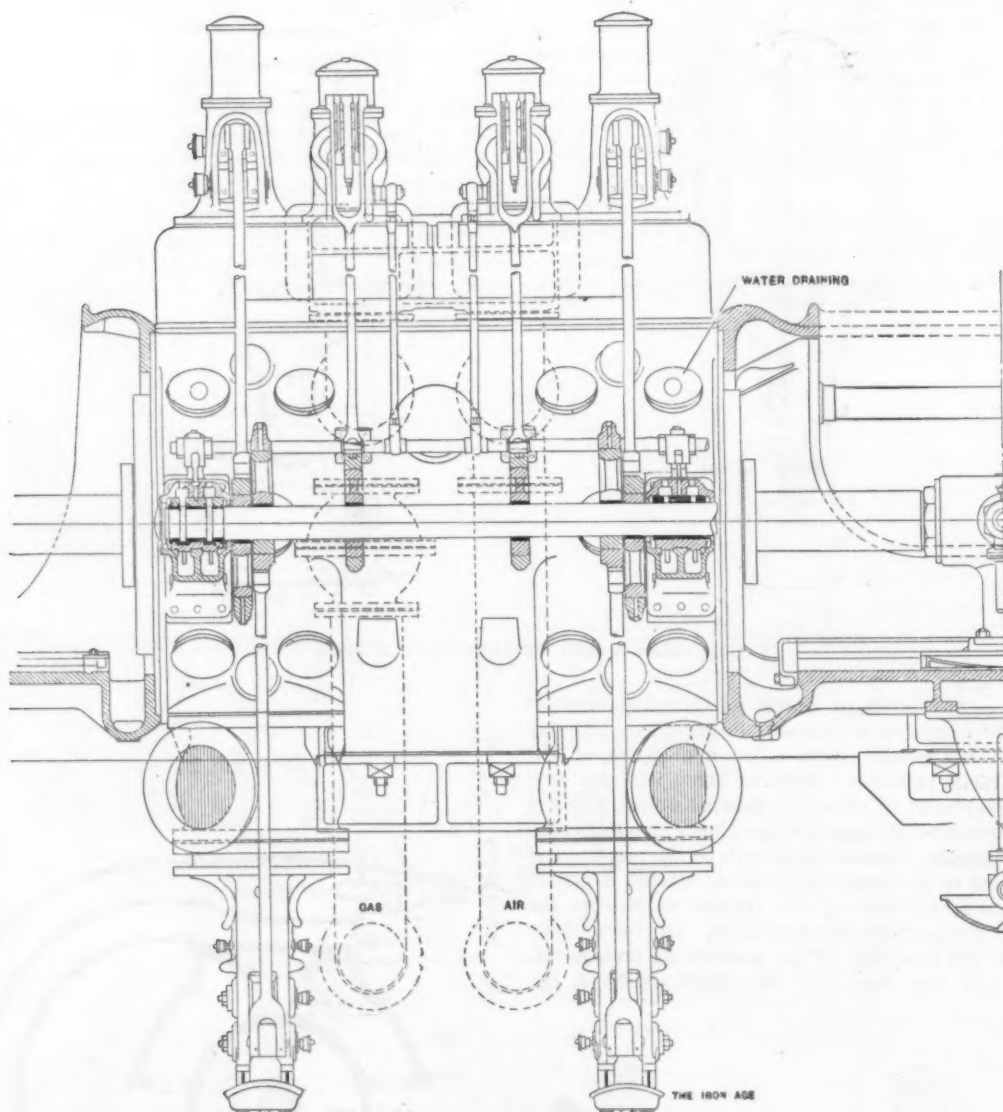


Fig. 25.—Governing and Regulating Mechanism.

The pig lead, whose production has in this way been increased, will now receive the benefit of a greater home demand, due to the operation of the Montreal corroding works, to which the increased duty will give a stimulus. As an adjustment to this change Mr. Fielding raised the duty on white lead ground in oil from 25 to 35 per cent. ad valorem.

The duty on cement is now levied per 100 pounds, the weight of the packages to be included. British cement, Belgian and other foreign cements are brought in in casks and barrels, the weight of which is very considerable. But where cement is brought in from across the border in bags the weight of the bag is so trifling that there is practically no duty on the package where the cement comes from the United States. To remove that discrimination a tax of 25 per cent. ad valorem is put on the bags which contain the cement.

Machinery and Settlers' Effects.

Settlers' effects free of duty are to be more carefully defined, so as to prevent the admission of contractors' outfits and other plant intended for sale in Canada. During the past year, the Minister said, trouble had arisen over entries of this description, since construction

exclude American silver from the money circulation in Canada. The Finance Minister announces that an arrangement will be made with the banks, the latter to collect the silver and the Government to express it to the United States. The banks are to take it at par; they

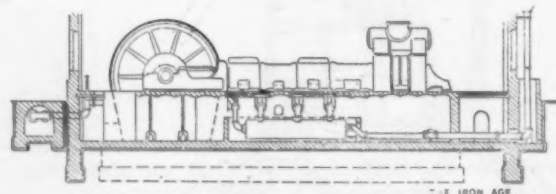


Fig. 26.—Blowing Engine with Tandem Gas Engine at Rombach.

are to receive from the Government a commission of three-eighths of 1 per cent. for their trouble and the Government is to pay the express charges. Mr. Fielding said there would be no objection to American silver in Canada if Canadian silver were tolerated in the United States. But Canadian money of any kind is as a rule rejected there. Mr. Fielding estimates the amount of

American silver coin now in the circulation is not more than \$900,000. Its place will be taken by Canadian coins, the seigniorage on which will many times over compensate the Government for the cost of the deportation.

Comment on the Changes.

The Carter White Lead Company of Montreal is the manufacturing concern referred to by Mr. Fielding. Its works in that city were begun early in the present year. The company is of United States parentage. Lead ore mined in the Kootenays was until recent years sent to United States works, where it was smelted, the lead separated and sent back to Canada in pigs or more finished forms. It looks now as if the Canadian chain of production required to bring the commodity to its most finished form were complete. Robert Munro, general

a few years since 30,000 barrels sufficed. Between 1,000,000 and 2,000,000 barrels is now required. Britain and Belgium were the chief outside sources of supply at first, but the United States soon took first place. At present the greater portion of the demand is met by home producers. From the United States the cement comes in bags four to the barrel. These cost probably 10 cents each. At 25 per cent. the duty on the four bags would be 10 cents.

The amendment of the provision making settlers' effects free will be felt by American manufacturers of agricultural machinery. It is alleged that the farmers, who are moving in such large numbers from the Western States to the Canadian Northwest the last few years, bring with them new equipment—harvesters, plows, &c.

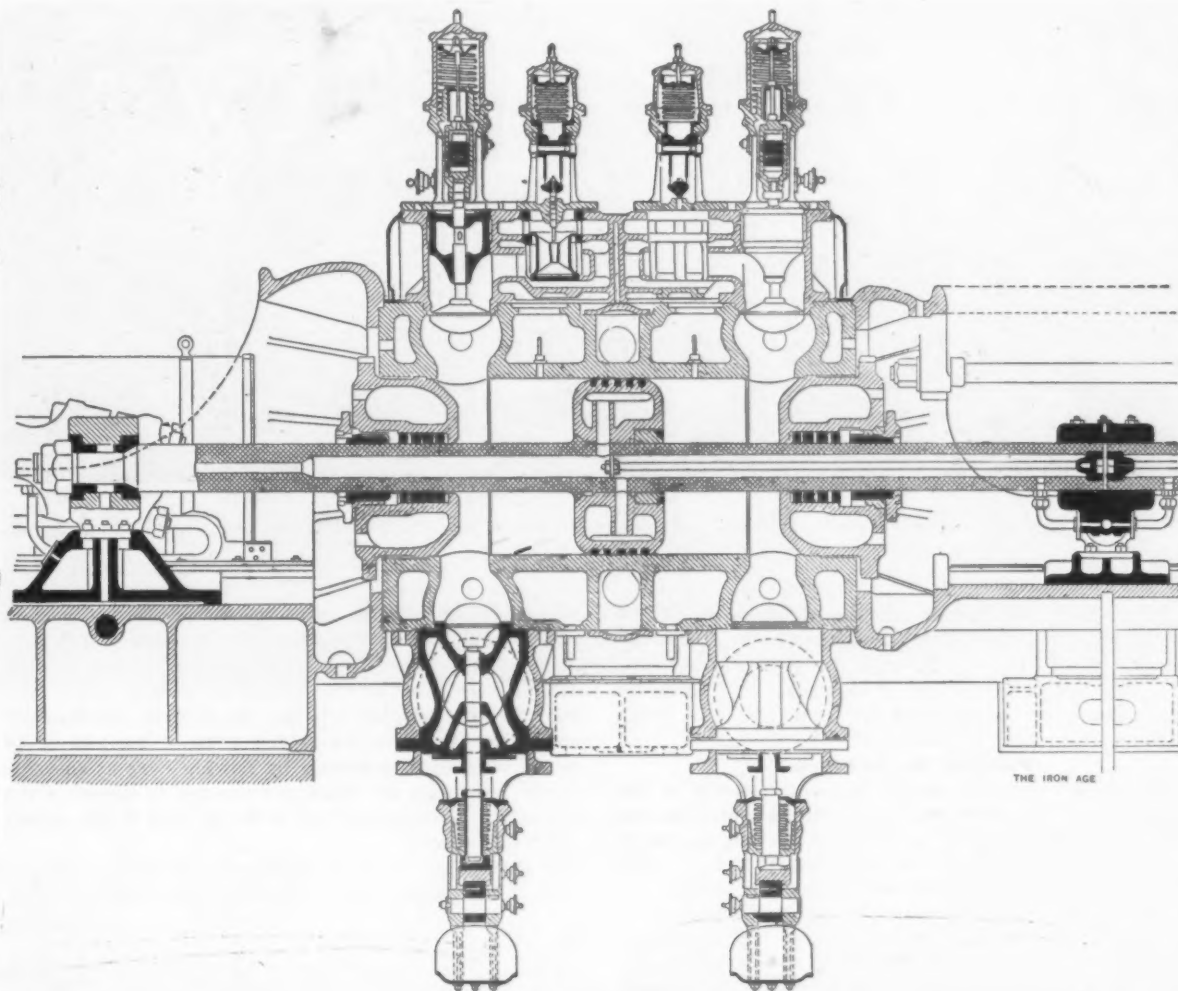


Fig. 27.—Double Acting Two-Cylinder Tandem Four-Cycle Engine (Nuremburg).—Longitudinal Section of Cylinder with Valve Gear and Cooling Water Supply.

manager of the Canada Paint Company, who was in Toronto yesterday, is reported by one of the evening papers to have expressed himself as follows:

The change in duty on dry white lead which raises it from 5 per cent. to 30 per cent., though a very serious one, is quite consistent with the duties on other lead manufactures. The immediate effect is an advance of about \$20 per ton on all straight white lead paint. The added cost of white lead must result in an advance in paints generally, but the Canada Paint Company has not decided upon any advance on general paints until we shall ascertain whether dry white lead presently under contract may come in under the old duty. Should Mr. Fielding concede this there would probably be no increase in price of general paints until at least the whole matter is disposed of by the Tariff Commission.

Referring to the effect on German, American and British makers of white lead, he said that the duty plus the surtax will amount to 40 per cent. on German white lead, it will be 30 per cent. on American, and, minus the preferential discount, it will be 20 per cent. on British.

So far as the cement trade is concerned the duty on the bags will scarcely make much difference. Canada is now a very large consumer of cement, as construction is proceeding at a rapid rate all over the country. It is but

Referring to this one official of the Massey-Harris Company, Toronto, is quoted by the *Toronto Telegram* as follows:

We know, of course, that American manufacturers are selling agricultural machinery in large quantities direct to settlers preparing to move over into Canada. The manufacturer thus markets his goods without paying duty and at a freight rate of about a third to Winnipeg what it would cost us to send the same machine to Winnipeg. I cannot give figures as to the volume of this business. It is growing larger and would increase more and more if not stopped. I think it a very good step on the part of the tariff adjusters and one that should work to the benefit of Canadian made machines.

C. A. C. J.

The Gröndal-Kjellin Company, Limited, was chartered in London, England, recently with a capital of £100,000, for the purpose of exploiting the Gröndal process of concentrating and briquetting iron ores. The company also controls the Kjellin electric furnace, designed for the electrical production of steel. Naylor, Benzon & Co., London, are interested in the new company, and it is represented in the United States by Naylor & Co., 45 Wall street, New York.

Causes of Rail Failures in Service.*

BY ROBERT JOB.

For a number of years a careful study of causes of rail failures has been made by the Philadelphia & Reading Railway. The method followed has been in the case of each failure to forward a portion of the rail showing the defective condition to the test department, with a form giving information regarding the manufacture and service of the rail. An investigation then followed to determine the cause of the failure.

In a general way it may be said that when failure occurs owing to fracture, excessively rapid rate of wear

mill to crop ingots down to sound steel, and such a rail is nearly always derived from metal from the top of an ingot and almost invariably fails when tested under the drop test. When the mill inspection is watched closely and when it is seen that the test butt for the drop test is always taken from the top of the ingot failures due to such pipes are relatively rare. A defect of this character is one of the most dangerous which can be present, since it is liable to result in sudden crushing under light pressure, and consequently it should be guarded against most carefully at the inspection.

Blowholes the Most Common Defect.

The second cause of failure—viz., presence of a considerable proportion of blowholes in the steel—is prob-



Fig. 1.—Pipe in Steel. Section Polished but Not Etched.

Fig. 2.—Wing Rail, Unsound Steel.

Fig. 3.—Unsound Steel. Service Five Months.

under given conditions or crushing down in track the poor service is generally due to one or more of the following causes—viz.: (1) Pipes in the steel, (2) presence of a considerable proportion of blowholes, (3) excessive segregation, (4) coarse granular structure, (5) rough handling.

Failures Due to Pipes.

In the first case the defect is readily shown by the appearance of the fractured end with its unwelded surfaces, and upon buffing off a section of the rail the extent

ably the most common defect under present mill practice and the one which causes the largest number of failures in service to-day. Such rails usually do not fracture after a very short service unless the extent of the blowholes is very pronounced, but the defects are generally noticed by the gradual mashing down of portions of the rail, accompanied generally by flowing over at the sides of the head, and the trackmen are apt to complain that the rail in question is "too soft" or that it has numerous "soft spots."

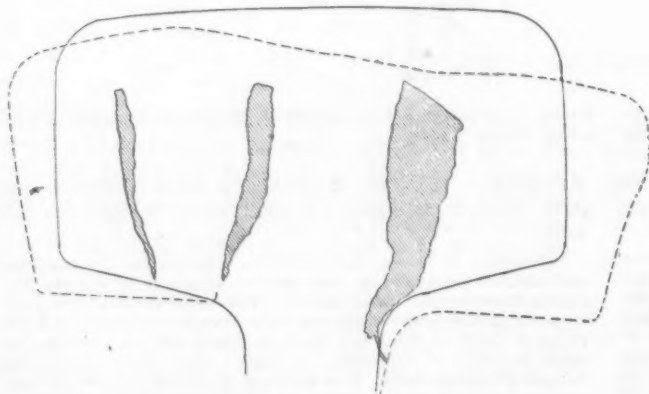


Fig. 4.—Contour of Fig. 3 After Service of Five Months.

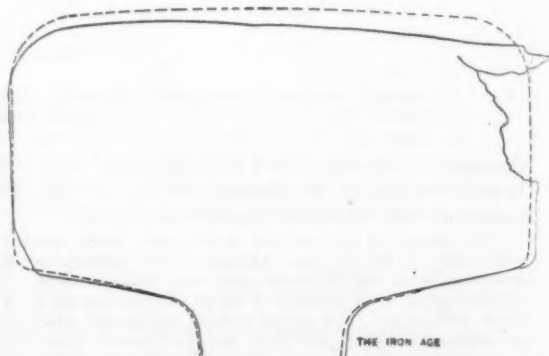


Fig. 5.—Contour of Fig. 6. Service Two Months.

of the pipe is generally clearly shown, even without etching, as in Fig. 1. In such case the steel is in a seamy condition and the layers readily split apart or crush down upon comparatively slight pressure, and indication of the unsoundness is usually given after a very short service. This general type is caused by failure at the

Analysis proves, however, that the metal is not softer than that in other rails adjoining the defective one, but upon polishing and etching the section lightly with iodine or other medium it will be found that the steel is unsound, or, in other words, that blowholes, slag and other foreign matter have prevented thorough welding of the steel and have resulted in a number of seams, which break up the solidity of the metal and permit a slipping apart of the unwelded surfaces under moderate

* A paper read at the Atlantic City meeting of the American Society for Testing Materials, June, 1905. Mr. Job is chemist of the Philadelphia & Reading Railway Company.

pressure, causing final fracture or crushing. In some cases this condition is caused by presence of slag and of oxides in the steel, but in the greater number of instances it is simply due to blowholes, and relatively little slag or oxide is present.

Fig. 2 represents the heel of a wing rail of a frog of the following analysis:

	Per cent.
Carbon	0.63
Phosphorus	0.137
Sulphur	0.078
Manganese	0.874

This rail crushed down in service upon another road into the condition shown in less than five weeks.

Figs. 3 and 4 represent a batch of rails which mashed down in a few months upon another road to the contour represented by the dotted line. The unbroken line in Fig. 4 represents the template, and the shaded areas indicate holes in the steel which were formed by the elongation of the metal upon the top of the rail when the failure began. When this section was polished there was no indication of an actual pipe, but upon light etching the cause of the weakness is very evident, showing

inch of the surface, whereas in the cases in which the rails have sustained long and heavy traffic we have found comparative freedom from such defects. A case of this kind which was investigated a couple of years ago will illustrate the point:

A number of rails from a single rolling had mashed down in track after two months' wear to the general form represented by Fig. 5, the broken line representing the template. These defective rails were upon curves and upon tangent and were from various heats throughout the rolling, but rails from the same heats and immediately adjoining the defective rails were unaffected by the traffic. It was found that composition had nothing to do with the failures, but upon polishing and etching the sections we found in the cases in which flowing and splitting occurred that the steel was unsound, as indicated in Fig. 6, while the rails adjoining, which were in good condition, were of sound steel, as indicated in Fig. 7.

Form of Section Not Material.

We have also investigated a considerable number of rails to determine whether or not the form of section

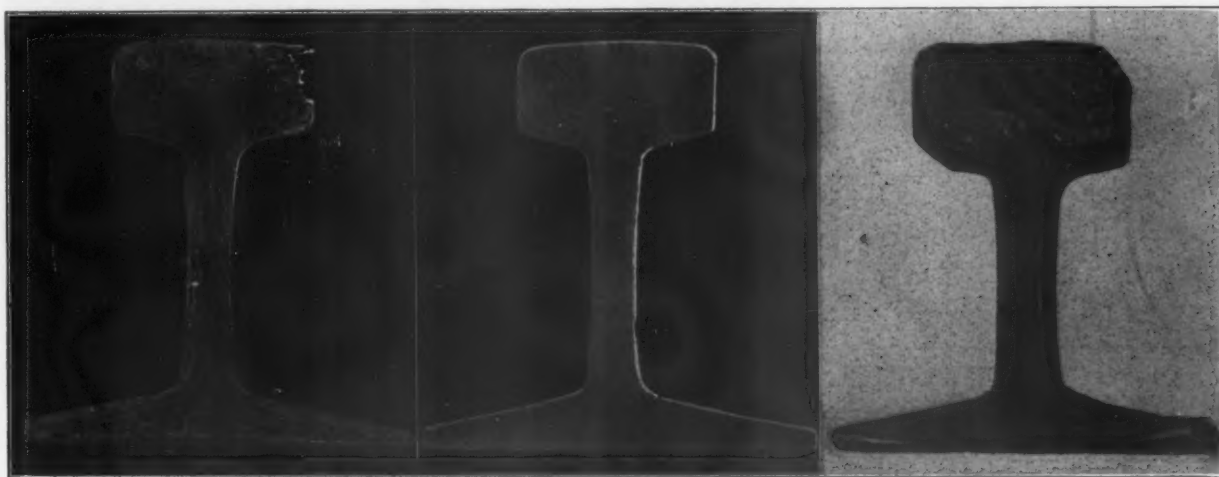


Fig. 6.—Unsound Steel. Service Two Months. Mashed Down as Shown in Fig. 5.

Fig. 7.—Sound Steel. Service Two Months. Rail Next in Track to Fig. 6. No Tendency to Mash Down or Flow Over.

Fig. 8.—Segregated Rail. Broke Under Drop Test.

that the steel is so thoroughly unsound and porous that rapid crushing was possible. The composition of this rail was:

	Per cent.
Carbon	0.82
Phosphorus	0.102
Manganese	0.88
Sulphur	0.053

The heat average was:

	Per cent.
Carbon	0.59
Phosphorus	0.075
Sulphur	0.074
Manganese	1.06

It is thus seen that a marked segregation was present as well as great unsoundness, and it is evident that the cropping at the mill had been insufficient to get to sound and reasonably homogeneous metal. These rails were furnished under the mill's own specifications and guarantee.

Flowing and Splitting.

The tendency of some rails to flow over and form a "lip" has been referred to and this frequently is attributed to mere softness of the steel. Our experience has been that a rail with carbon as low as even 0.33 per cent. will not flow over under exceedingly heavy traffic, provided sound steel is present, with granular form fine enough to render the metal tough and strong, and in every instance of flowing over or of breaking down of the side or corner of the head we have found presence of blowholes or other unsoundness near the surface or corners of the head of the rail, generally within $\frac{1}{8}$ or $\frac{1}{4}$

exerted an influence upon the tendency to crush in service, and it has been clearly proved that ability to withstand crushing under heavy service is due not so much to any particular form of section as to the relative freedom from unsoundness in the metal. In connection with this question an examination was made about a year ago upon a lot of rails which were removed from main track and relaid in branch lines. The section had a rather deep head, with contour approximating that of a wheel flange. Practically no flowing and no crushing was found in these rails after 15 years' service, while a number of rails of the American Society section, laid in adjoining parts of the same track, had crushed and otherwise failed in a very few years. The composition of the different lots showed comparatively little variation, but in the case of the rails which crushed in service we invariably found unsoundness of the general type indicated by Fig. 6, whereas in the good rails the steel was practically sound within $\frac{1}{2}$ inch of the surface of the top and sides of the head. In other words, the good service was due mainly to the greater care exercised in the manufacture of the earlier rails and their consequent relative freedom from unsoundness.

Up to this point we have made little mention of granular structure of the metal, and it may be inferred that this has little influence upon the permanency of the rail in track. On the contrary, we have reason to regard a uniform, fine granular structure of high importance, both in reducing rate of wear and in cutting down liability of fracture; but it is an unfortunate fact that the very best of steel as regards granular form or composition

may be completely and quickly ruined from the standpoint of efficiency in track, or, in other words, as to its value as a rail, by failure in manufacture to insure reasonable freedom from unsoundness. This, to our mind, is an integral point in the manufacture of rails, for if any material degree of unsoundness exists in the rail within a distance, say, of $\frac{1}{4}$ or $\frac{1}{2}$ inch from the head or sides and more particularly near the upper corners unsatisfactory service under heavy traffic is almost certain to result regardless of the composition or method of rolling. Such at least has been our invariable experience.

Few Failures from Segregation.

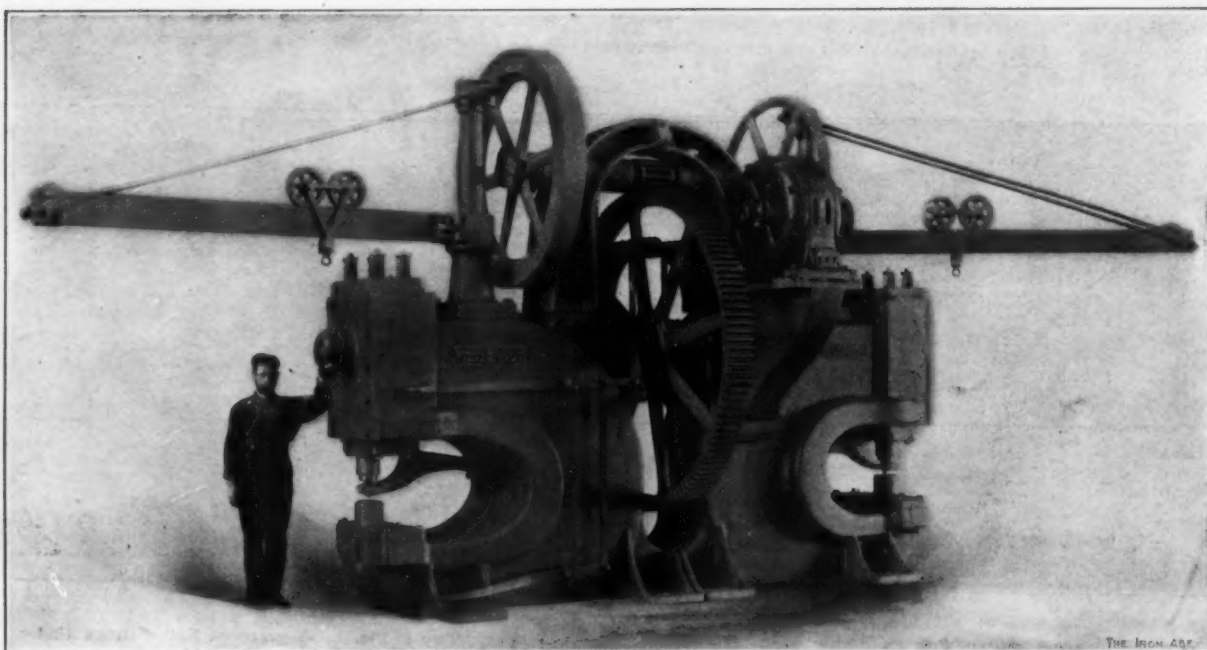
As to injurious segregation, we find that relatively few failures in track are due to this condition. If ingots are not properly cropped, or if they are allowed to remain in the furnace with the interior of the ingot in a liquid condition for an excessive time, segregation of course results, and if the test butt from each heat is

fied at a glance and can be distinguished from a fracture caused by pipes, since the latter extend with the unwelded faces more or less parallel with the contour of the rail.

Unsound Steel the Chief Cause of Failure.

To sum up, the results of our investigation indicate that the greater part of the difficulty which occurs today with rails under heavy traffic is due to unsound condition of the steel, a condition which existed in comparatively slight degree in the earlier rails.

There has been a marked improvement in practice at some of the mills over that generally prevalent a decade or two ago, and this has resulted at such mills in producing a much finer granular form throughout the section and hence a tougher and better wearing rail if only the metal were sound; but, unfortunately, in the essential element of soundness of the steel there has been direct retrogression, making it appear that the main



A Large Double Punch and Shear. Built by the Bement-Miles Works of the Niles-Bement-Pond Company.

taken, as should invariably be done, from the top of the ingot, badly segregated rails will fail, and consequently under such conditions careful guarding against segregation is as much for the interest of the manufacturer as for that of the consumer. Fig. 8 represents one such rail which failed under the drop test, and the extent of the segregation is shown by the fact that the proportion of carbon at the outside averaged 0.49 per cent., while at the center of head borings taken with a $\frac{1}{4}$ -inch drill averaged 0.76 per cent. Also it will be noted that blow-holes extend all along the top of the head. Such cases as this, however, are rare.

Under "failures due to rough handling" we have found a considerable number from time to time. The initial fracture may, of course, occur either at the mill at straightening presses or in loading into high side cars and letting fall upon other rails 5 feet or more below, or in letting the rails fall from the loader 6 or 7 feet upon the ground, and the same thing, of course, may occur after receipt of the rails in unloading, unless they are skidded out or otherwise got to the ground without any considerable shock. Careful inspection will remedy this condition. A fracture of this type is characteristic. It begins generally across the base of the rail and extends up a short distance into the web; then it works along the web sometimes for a distance of 6 feet or more, with the face of the fracture in a plane at right angles to a vertical line down through the rail, and the steel finally snaps off up through the head.

A fracture due to this cause can generally be identi-

attention in the manufacture has been fixed upon quantity and not quality of the output.

A Bement-Miles Large Double Punch and Shear.

A double punch and shear of notable size, built by the Bement-Miles Works of the Niles-Bement-Pond Company, 111 Broadway, New York City, is shown in the accompanying engraving. This machine is designed for punching $1\frac{1}{2}$ -inch holes in $1\frac{1}{2}$ -inch steel plates and for shearing $1\frac{1}{2}$ -inch plates, $8 \times 1\frac{1}{2}$ inch flat, 3 inch round and 3 inch square bars. One throat has a gap depth of 36 inches and the other throat is 30 inches deep.

The view shows both heads of the machine arranged for punching, but if desired both heads may be arranged for shearing or one for shearing and the other for punching. Special fixtures may also be furnished for punching channels, I-beams and other shapes. The heads are driven by heavy eccentric shafts acting upon pintles, and each head is provided with an automatic device for stopping it at the top of its stroke. The eccentric shafts are driven by a large gear through clutches. The motor is of 20 horse-power capacity and is directly geared to the machine.

Each head of the machine is equipped with a self contained hand crane, which swings about a post bolted to the frame of the machine. These hand cranes have 8-foot jibs and are capable of hoisting loads up to 4000 pounds.

Trade Publications.

Engine Safety Devices.—Consolidated Engine Stop Company, 100 Broadway, New York City. Catalogue. Describes the Monarch engine stop and speed limit system. Gives a partial list of installations. The Monarch system employs a mechanical device operated by electricity that can be applied to any engine regardless of make, size or speed. It supplements the governor and automatically shuts down the engine at any predetermined overspeed of the fly wheel. It also automatically shuts off the steam if the cylinder head blows out or stops the engine if a rope breaks or if a rope in the rope drive is in any way damaged. Circuit closers are placed at distant parts of the plant so that the device may be operated in case of an accident at any distant point. The same company is also mailing a booklet, "The Law of Employers' Liability," gotten up to represent a law book, the back cover showing the head and shoulders of a judge. It contains a decision handed down by Justice Douglas of the Supreme Court of Rhode Island which released the plaintiff from liability in connection with an accident to a workman inasmuch as his plant was equipped with safety devices. These happened to be of the Monarch safety stop and speed limit system.

Gasoline Engines.—Southern Machine Mfg. Company, 731 East Cary street, Richmond, Va. Circular. Gives the advantages of the Little Wonder gasoline engine, claimed to be the simplest, most economical, most durable and safest engine made.

Drop Forgings.—Wyman & Gordon, Worcester, Mass., and Cleveland, Ohio. The last of the short stories of engineers issued by this company in lieu of a catalogue deals with the life of Isambard K. Brunel, one who had much to do with the problems attending the introduction of railroads and steam navigation.

Machine Tools.—B. F. Barnes Company, Rockford, Ill. Illustrated catalogue; size, 5 $\frac{1}{4}$ x 8 $\frac{1}{4}$ inches; contains illustrations, brief descriptions and specifications of a new bench drill; 12, 14, 20 and 23 inch upright drills with stationary heads; 23, 26, 28 and 31 inch sliding head upright drills; horizontal drilling, boring and tapping machines; multiple spindle drills in 14 and 20 inch sizes; automatic revolving chucks; 23 and 26 inch gang drills; gas and gasoline engine boring machines; electrically driven tools, including a grinder; foot power lathes, 9 and 11 inch sizes; an emery tool grinder, key seating punch and various small tools and parts, such as chucks, rests, lathe tools, drills, &c.

Second-hand Machinery.—Niles-Bement-Pond Company, 111 Broadway, New York City. List of second-hand metal working machinery, including screw cutting lathes, speed lathes, chucking and turret head screw machines, planers, shapers, drills, cutting-off and centering machines, tapping machines, milling machines, boring machines, punches and shears, grinding machinery and miscellaneous machinery.

Universal Pipe.—Central Foundry Company, 116 Nassau street, New York City. Catalogue and price-list "U" (second edition). Contains in addition to the matter in an earlier catalogue on universal pipe and fittings for gas, compressed air, &c., illustrations of the 12 and 14 inch sizes of universal pipe which have lately been added to stock. Although this pipe has only been on the market for three years its use has grown with remarkable rapidity.

Electric Motors.—Diehl Mfg. Company, Elizabethport, N. J. Bulletin No. 100. Contains description of the types D and E motors, built in sizes from $\frac{1}{2}$ to 2 horse-power. These are recent designs of multipolar form, in which compact and symmetrical appearance has been given particular attention. The bulletin deals separately with the frame, armature, rocking ring, commutator, brush holders and all of the essential parts.

Electrical Machinery.—General Electric Company, Schenectady, N. Y. Special publication, bulletins, price-lists, &c., No. 3287, is an 8 x 10 $\frac{1}{2}$ inch stiff covered booklet, 27 pages, entitled "Electricity on Steam Railroads for High Speed Service." Refers particularly to the 95-ton electric locomotive built for the New York Central Railroad and described in *The Iron Age* November 17, 1904. An interesting part is that pertaining to tests of this locomotive and advantages of electric locomotives. Views are given of other notable electric locomotives. Bulletin 4404 deals with CL-B type slow and moderate speed continuous current motors; 4405 deals with starting compensators for alternating current motors, and 4406 with induction motors. Flyer 2150 refers to red core wire and cable manufactured in accordance with the requirements of the National Board of Fire Underwriters. Circular 3308 shows a number of automatic circuit breakers with carbon break, type C, form P. Price-list 5135, superseding 5129, concerns fan motors.

Compressed Air Plant.—Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York City. Illustrated booklet; size, 6 x 9 inches; pages, 32. Contains a reprint of an article from the *Engineering News* on the compressed air power transmission plant of the Cleveland Stone Company at its Gray Cañon quarry near North Amherst, Ohio, the largest sandstone quarry

in the world. This is supplemented by an outline of the extensions of this system whereby the plant now carries the combined loads of the Gray Cañon, the Malone and the Mussey quarries.

Inter-Pole Variable Speed Motors.—Electro-Dynamic Company, Bayonne, N. J. Mailing card. Gives illustrations of the floor, ceiling and wall types of inter-pole variable speed motors, described in *The Iron Age* February 2, 1905.

Hydraulic Rams.—Columbia Engineering Works, Portland, Ore. Catalogue; size, 6 x 8 inches; pages, 54. Contains interesting description and illustrations of the Phillips hydraulic ram, and gives facts and figures in support of its claims of superiority by virtue of its ingenious valve mechanism. The most interesting feature of the latter is that by the peculiar construction of the waste valve the shock so pronounced in old style rams is avoided, making it possible to increase the size and capacity of single units to mammoth proportions. Much useful information is given on subjects of hydraulic engineering, particularly as allied with the use of hydraulic rams. In small sizes the company builds the Culpan hydraulic ram, which is also shown in the catalogue.

Reciprocating Screw Threaders.—Waterbury Farrel Foundry & Machine Company, Waterbury, Conn. Circular. Contains description and illustrations of reciprocating screw threaders for rolling threads upon wire and screw blanks. One of the largest sizes of these machines was illustrated in *The Iron Age* May 4, 1905.

Clutches.—Double Friction Coil Clutch Company, 42 River street, Chicago, Ill. Pamphlet. Pertains to the double friction coil clutch and shows a number of its applications. The clutch was described in *The Iron Age* May 4, 1905.

Water Tube Boilers.—Henry Vogt Machine Company, Louisville, Ky. Bulletin No. 1. Contains an account of the construction and features of performance of the Vogt water tube boilers. Some of the advantages claimed for these boilers are accessibility for cleaning and inspection, steadiness of water level, rapid circulation, dry steam, efficiency, durability and safety. These boilers are made in two patterns, Class C and Class D. The latter requires less head room. *The Iron Age*, May 4, 1905, contained an illustrated description of the Vogt boilers.

Lathes.—Fay & Scott, Dexter, Maine. Illustrated catalogue; size, 6 x 9 inches; pages, 32. Contains an account of the special features of Fay & Scott's pattern makers' lathes, followed by descriptions of 10, 16, 18, 20, 24, 30 and 36 inch improved pattern makers' lathes; 36-60 inch extension gap pattern makers' lathe, 90-inch pattern makers' face plate lathe, improved pattern makers' head and tail stocks, wood turning tools and hand turning tools.

Water Softening Apparatus.—Booth Water Softening Company, 126 Liberty street, New York City. Illustrated catalogue; size, 6 x 9 inches; pages, 22. Describes in detail the operation of three types of water softeners. A brief description of the construction and operation of important devices used in connection with the machines is also given.

Electrical Drills and Grinders.—Cincinnati Electrical Tool Company, Cincinnati, Ohio. Bulletin. Contains illustrations, description and table of dimensions of a portable electric drill made in three sizes, $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ inch, to be run on direct current. Description and illustration is also given of a portable electric grinder.

Screws and Bolts.—The Cleveland Cap Screw Company, Cleveland, Ohio. Illustrated pamphlet. Contains an interesting description of the Cleveland Cap Screw Company's method of making finished screws and bolts by electric welding, including the welding of brass heads on steel bolts. Cap screws, set screws, collar screws, coupling bolts, planer head bolts, milled studs, semi-finished nuts and taper pins are thus manufactured. This concern makes a specialty of special and irregular work for engine and high class machinery manufacturers.

Wire Machinery.—Alton Machine Company, 126 Liberty street, New York City. Bulletin No. 7, showing a seven-wire stranding machine, and bulletin No. 18, showing cable reel winding gear.

Fan Motors.—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Folders 4044 and 4045. First pertains to fan motors for direct current circuits of the desk and wall types, and the second to alternating current fan motors.

Power Transmission.—Brown-Wales Company, 60 Purchase street, Boston, Mass. Pamphlet. Contains sizes and price-list of various pieces of power transmission apparatus, including shafting, steel and wood pulleys, couplings, hangers, bearings, pillow blocks, clutches, angle drives, shaft collars and belting.

The American Rolling Mill Company, Middletown, Ohio, advises us that an error was made in last week's issue in stating that Goff, Horner & Co., Limited, Pittsburgh, are the company's sales agents for the Eastern district, including New York, New Jersey and New England. They are the Pittsburgh sales agents, while Denman & Davis, 85 and 87 John street, New York, will represent the company in New York, New Jersey and New England.

THE IRON AGE

1855—1905.

New York, Thursday, July 13, 1905.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	-	PUBLISHER
CHARLES KIRCHHOFF,	-	-	-	-	-	-	} EDITORS
GEO. W. COPE,	-	-	-	-	-	-	
A. I. FINDLEY,	-	-	-	-	-	-	
RICHARD R. WILLIAMS,	-	-	-	-	-	-	HARDWARE EDITOR

The Philadelphia office of the David Williams Company has been removed from the Forrest Building to room 1515 in the Real Estate Trust Company Building, on the southeast corner of Broad and Chestnut streets.

The Iron Age Index.

The index to the reading matter of Volume 75 of *The Iron Age*, for January 1 to June 30, 1905, has been compiled and printed, and will be mailed to those subscribers of *The Iron Age* who will make application for it.

To relieve those who bind or file *The Iron Age* of the trouble of future applications for the semiannual index, we have a special list of addresses to which the index is forwarded without further notice. Subscribers who desire their addresses entered upon that list will kindly so advise us.

Waiting for the Low Point.

It has been evident for several weeks that buyers of pig iron have set themselves in a determined way to catch the market at low point before buying again for extended deliveries. This waiting policy is pursued, too, with a good appreciation of the probability that when buying is renewed there will be so many foundrymen in the market within a short period of time that some of them will pay a higher price than others. Foundry yards, on the testimony of observant salesmen, are quite bare of iron. This fact, together with the reports of generally full shipments on contracts and the small lot buying for early needs, tells the story of a disposition to test conclusions with the makers still further.

The present situation is but natural in the light of the experience of many foundry buyers in the fall of 1904. After hanging at \$9 for No. 2 foundry iron at Birmingham through the early summer, Southern iron advanced in the first week of August to \$9.25. The active coke iron producing capacity, which was 272,300 tons a week on July 1, fell to 246,090 tons on August 1. This, it may be said parenthetically, represented a rate of production about 10,000,000 tons a year less than in April and May of this year, when the rate of about 2,000,000 tons a month for all descriptions of pig iron was reached. In August, 1904, merchant stocks of pig iron declined from 670,000 to 610,000 tons, and while there was an increase in active producing capacity in that month, it was confined practically to steel company furnaces; so that the definite turn in the conditions as to merchant iron became plainly apparent. Prices advanced steadily in the weeks following, reaching \$12 at Southern furnaces early in November, or an advance of \$3 in three months. By the end of the year high point on good sized contracts was reached at \$13.50, Birmingham, a total advance of \$4.50 on the movement. The occasional buying of the early months of this year and the two months of practical deadlock which the trade has passed through are familiar

It will be recalled by a good many consumers of foundry iron that the upward movement of last fall was well

under way before they believed in it. And when they decided to protect themselves against further advances they did so under protest. However, the strong buying of last October and November was justified in the outcome, though December buyers, who covered to the middle of this year, have had some reasons for regret.

In making up his decision as to the arrival of the critical point in the market the foundry buyer has to consider the general business outlook, the conditions in his own trade and the questions of stocks and production of pig iron. Whatever the exact returns from the ground may prove to be in 1905, there is no evidence yet that the business community has any serious fears of the crop outcome, though the alternation of good and bad news will be seen for two months to come. The foundry trade has improved vastly upon the situation existing during the heavy pig iron buying of the late months of 1904. Certainly there was great room for betterment. And just now a large tonnage of midyear contracts for castings is under discussion, with the pig iron price an important element. Relative to the third factor—the supply and present consumption of pig iron—the current statistics give some light, but not all that could be asked. It was the enormous steel production that forced the 2,000,000-ton blast furnace records in the spring months, and it was largely curtailment of production in certain lighter forms of finished steel that led to the contraction in pig iron output seen in recent weeks. Just how the consumption of wire, sheets, tin plates and steel bars has compared with production in the first half of this year cannot be determined; but the stocking up process that has followed the months of bare warehouses in 1904 favors the belief that ultimate consumption has not equaled output. It would seem that for some time the difficulty of thoroughly sifting the situation as to these lighter steel products may make it difficult to analyze the pig iron figures. Merchant stocks include a very considerable accumulation of Bessemer iron at Mahoning and Shenango Valley furnaces. Foundry iron stocks have grown somewhat of late also and the market is still in the buyer's favor. Undoubtedly an important element in the deadlock all along has been the fright taken by the iron trade at almost a 24,000,000-ton rate of pig iron production for a few months, as against but 16,500,000 tons for 1904.

If history were to repeat itself a new buying movement would begin with a break from the low price current on small lot sales. Thus, if the conditions prevailing in the summer of 1904 brought a \$9 price for Southern iron and \$11.75 for Northern No. 2, the question now is at what point between \$9 and \$10.75 for Southern No. 2 and \$11.75 and \$14 for Northern No. 2, at furnace, will new buying begin under the far larger consumption of to-day.

Big Incomes from One Business Operation.

Colossal figures are inviting subjects for contemplation and comparison. In *Pearson's Magazine* for July appears an article by Charles M. Harvey, who has been impressed by the magnitude of the Pennsylvania Railroad Company's operations. He furnishes a most interesting array of comparative figures which show how the revenue of one railroad company surpasses the Government receipts of important countries. The gross earnings of that company in the calendar year 1904 he places at \$118,000,000, and he truly says: "This sum is too great to be grasped by the ordinary comprehension." Only the large nations exceed in revenue these figures. The Pennsylvania Railroad Company, he proceeds, has twice the in-

come of the Dominion of Canada, which has 7,000,000 inhabitants and an area greater than that of the United States. Mexico, with a population of 14,000,000, has an annual revenue of but \$75,000,000. Except the United States, the only country in the Western Hemisphere which has as large a revenue as the Pennsylvania Railroad Company is Brazil. Its earnings are greater than the treasury receipts of the Netherlands and Sweden and Norway combined. They are much greater than the revenue of Turkey and its old enemy, Greece. They are greater than that of all the Balkan States—Roumania, Servia, Bulgaria and Montenegro—taken together. Japan's army and navy, says this writer, have been filling the trump of fame for over a year, yet the income of the Government of the 46,000,000 Japanese in the fiscal year 1903-1904 was approximately the same as that of the Pennsylvania Railroad Company. These comparisons have their value in enabling one to comprehend, to some extent at least, the enormous volume of business transacted by single corporations of the present day.

In taking his figures, however, the author referred to has committed a singular oversight, as he only gave the earnings for the Pennsylvania lines east of Pittsburgh and Erie. The total earnings for the entire Pennsylvania system in 1904 were \$238,242,402, while in 1903, the maximum year, they were \$242,517,758. A comparison based upon these huge figures would have been very much more striking. Proceeding still further on this line of thought, if the earnings of the United States Steel Corporation had been taken as a test the showing made for the business done under a single management would have been vastly more impressive. That colossus of modern trade developments earned in the calendar year 1904 a sum immensely greater than that of the Pennsylvania Railroad Company, its total receipts being stated at \$444,405,431. This is below the amount earned in 1902, when the Corporation reported its total sales at \$560,510,479. These figures come up to the United States Government class. Our national revenues for the year ended June 30, 1905, aggregated \$543,423,859, which is considerably under the Corporation's earnings in 1902. The revenues of Austria and Spain united do not quite equal those of the United States Steel Corporation. The only countries in the world whose national income is larger than that of the Corporation are Russia, Great Britain, Germany and France.

No Ore Famine Imminent.

Tens of thousands of readers who a few years ago had no interest in industrial and commercial news are to-day following carefully what appears in the financial columns of the daily newspapers. As holders of industrial stocks these thousands want the facts about trade conditions as well as the resources of the companies in which they are interested. If they are investors in iron and steel securities they will be attracted by the discussions by the financial writers, of the questions of ore supply, the relative wearing qualities of Bessemer and open hearth rails or the effect upon earnings of the formation of an international rail pool. For example, it was gravely stated in a New York financial article last week of a certain company whose stock attracts attention now and then that "it has a monopoly of the manufacture of steel rails by a new process." Further on it was observed that the new process "produces a rail which is much harder than the present standard rail and will take the place of Bessemer rails on all the big railways." The same day another financial column said of the same company:

The company has a rail capacity now of 1000 tons a day and is practically the only important maker of basic or open hearth

rails—that is, rails made of ore that is free from phosphorus (!)—and it is contended that the open hearth rail is the only one that can meet the requirements of heavy train loads. It has been known for several weeks that the company was receiving a very large amount of rail business. In relation to facts of general importance, the company owns about 400,000,000 tons of ore, about 25 per cent. of all the ore deposits in this country. The present consumption of ore throughout the country is about 150,000,000 tons a year, or enough, without increasing consumption, to exhaust all the ore supplies in the United States in a decade.

Passing over the various surprises which the early sentences in the above furnish those who are intelligent on iron trade topics we call attention particularly to the alarm rung in the last sentence. With a pig iron output of 16,497,033 tons last year, this means a ratio of ore consumption of over 9 to 1, which might, indeed, raise startling queries concerning the foundation of our blast furnace and steel works operations. If we surmise that the writer has attempted some statistics as to the world's consumption of iron ore we find him still far astray, for that figure for 1903 is close to 102,000,000 tons, considering consumption as practically equivalent to production.

If we take 1,600,000,000 tons, as intimated above, to be an approximation of the iron ore reserves of the United States, it can be seen that the decade that is to see their exhaustion may be stretched into several decades, if we reckon consumption as the same as production in recent years. Based on a total production of 16,005,449 tons of iron ore in the United States in 1896, the estimated 1,600,000,000 tons would last a century. Taking the average of the past three years—35,554,135 tons in 1902, 35,019,308 tons in 1903 and 27,644,330 tons in 1904—1,600,000,000 tons would last about 50 years.

Without entering upon a discussion of the general question of iron ore supplies and probable consumption in the United States in the next three or four decades, the point to be made is that no stock market capital can legitimately be made out of any famine prospect. The estimate of 1,600,000,000 tons may be considered below the mark, counting only deposits whose extent has been calculated. Yet against this is to be set the remarkable way the consumption of steel has of doubling itself in less than 10-year periods and the fact that some producing consumers of Lake Superior ores are husbanding their own resources while making regular yearly purchases of a portion of their requirements. There is nothing sensational in the iron ore question, in other words, while there is a very thorough appreciation by producers of iron and steel of the prime necessity of providing for the needs of the remoter future.

Atmospheric Condensation Causes Damage.

A considerable financial loss to machine tool manufacturers of New England recently resulted from a curious, though not unprecedented, coincidence of atmospheric conditions. The weather had been cold, so cold in fact that workmen experienced considerable discomfort in the shops, and at the same time the humidity was unusual. Within the few hours from 11 a.m. to 2 p.m. the mercury rose more than 40 degrees. Heavy pieces of metal then began to sweat, not slightly but in great drops, as if rain were falling upon them. Thinner pieces of metal experienced little of this, because they soon took the temperature of the atmosphere. Heavier pieces, warming slowly, presented an appearance the like of which few foremen or workmen had ever seen.

At first the danger of the ruin of finished surfaces from oxidation was not realized. In one large shop, however, the manager, who chanced to be in the works, impressed the menace upon the minds of his employees. The moisture, with which the air was heavily laden, condensed with extreme rapidity, so that from a large surface the drops were scraped by the hand, to fall with a splash upon the floor, only to be replaced almost instantly by as

watery a condition. Parts of machines in process of manufacture and parts of the machines of the shop equipment were in imminent danger of serious rusting. The shop force went to work with much vigor. The only method that succeeded was to wipe away the moisture and instantly apply a coat of slush. This was done as far as possible, but many finished surfaces were damaged, either by a complete layer of the rust or by spots. Consequently considerable expense was entailed in refinishing such surfaces. The trouble was by no means confined to this one shop. Many machine builders suffered, some more seriously than others, because no one woke to the emergency.

Fortunately, such a circumstance is rare, for it is seldom that so extreme a change in temperature is experienced, especially when coupled with a humid atmosphere. Happily, also, smaller parts and shell-like pieces like hollow cylinders do not suffer because they quickly take the atmospheric temperature and there can be no condensation. To illustrate this, one large cylinder, perhaps 18 inches in diameter and $\frac{3}{4}$ inch thick, was not touched by rust, while large solid cylinders a few feet from it were seriously affected. If a portable steam blast were at hand or artificial heat given the exposed metal by some other means it would not suffer, of course, but in the machine shop such apparatus would be seldom available.

In the winter, where a shop is kept heated at a somewhat constant temperature—at any rate, at a temperature within limits so that there can be no extreme variation of temperature within a few hours—humidity may be disregarded. The only remedy when the condition does exist, as it must at times in a climate where extremes of weather are frequent, is to act quickly and intelligently, remembering that exposed finished surfaces must be given a moisture proof covering. Perhaps it would be well to prepare for such an emergency as soon as a cold, damp spell of summer weather makes its appearance by a generous use of slush. Of course, there is always the danger of comparatively trifling losses occasioned by an extreme dampness of weather, especially on the seaboard, where fogs are prevalent. But it would take not a few such occasions combined to equal the serious effects of the instance here noted.

Good Crop Indications.

The monthly report of the Department of Agriculture on the condition of the cereal crops, issued at Washington, July 11, shows a generally favorable outlook for the principal crops, including winter and spring wheat, corn and oats. The condition of both wheat crops showed a decline from the June report, but the indicated yield was much above the amount fixed by some crop experts whose reports had been given out earlier. The report is the first one of the year to include the corn crop. It showed an increase of 2,080,000 in acreage over last year and a condition above the ten-year average, giving promise of a corn crop of 2,651,110,000 bushels, or nearly 200,000,000 bushels more than was harvested last year.

The promised yield of winter wheat is 413,150,000 bushels, as compared with an indication of 371,000,000 bushels at this time in 1904 and an actual yield last year of 332,935,000 bushels. Recent reports by experts gave 370,000,000 bushels as the maximum of winter wheat. The spring wheat indication is for a crop of 293,376,000 bushels, which is almost the indication at this time a year ago.

The United Engineering Building Committee of the national engineering societies has awarded to the Wells Brothers Company, New York, the contract for the construction of the United Engineering Building, which will be located on West Thirty-ninth street in this city. The price named is \$795,000, which does not include any allowance for the heating plant, electric wiring, &c., but relates simply to the general construction of the edifice. The ground is already excavated and the work will begin forthwith. October, 1906, is mentioned as the probable date of completion and readiness.

Methods for Testing Cast Iron.*

BY RICHARD MOLDENKE, WATCHUNG, N. J.

In reviewing the situation as it exists to-day we see that all the work carried through in connection with the testing of cast iron lies in the direction of standard specifications. The only nations which have accomplished something definite are Germany and the United States. The others are still working at the problem.

American and English Pig Iron Specifications.

As pig iron is the basis of the foundry industry, our attention is first directed to it, and we find two general specifications in use—the American ones—and lately a pig iron contract drawn up in England. In the American specifications we have the direct recommendation that all iron be purchased by analysis. Next come detailed instructions for sampling and the course to pursue in case of a disagreement in the analytical work. An important omission, and one which it will take much time to supply, is the adoption of standard methods for analysis. Without these even the best specifications still leave a loophole for controversy. Incidentally it may be said that the American organization of foundrymen is taking this matter up and has already prepared a standard method for determining silicon in pig iron and cast iron. Total carbon is to follow, then sulphur, and so on. As these methods are to be tested out in practice outside of the foundrymen's organization we will learn their practical value for specification purposes better.

Continuing with the American pig iron specifications, we next come to the allowances and penalties. Here is given the limit of difference allowable in the pig iron delivered from that specified and the penalty that may be exacted where the limit is exceeded and yet not be too great to reject the metal. These provisions enable foundries to purchase pig iron with the reasonable assurance that they get what they want nearly enough without causing the slightest trouble in the shop routine. The cash penalty further prevents the furnace from taking chances on shipments to people who watch their supplies carefully.

For the benefit of the trade in general, inasmuch as only the minority of foundries are equipped with laboratories or have expert advice, there is given a table of base analyses of grades; so that if a man pins the specifications to his order and calls for a No. 3 iron he will get just what a No. 3 iron should be in composition so far as the silicon and sulphur is concerned. When the use of chemistry in the foundry is so general and the furnaces are run in such a way that one iron is as good as another, we may see these specifications extended to include the other elements. At present the phosphorus, manganese and the carbons are questions of brand and locality largely, the furnace industry being quite settled in classes for pig iron distribution.

Germany has not yet seen fit to standardize pig irons, and reports from the other side indicate that conditions are not so favorable there, the application of our American specifications being out of question for German irons. A man calling for pig iron with the sulphur we give—and be it said that our sulphur limit is high—would have to pay fancy prices in Germany, for they are badly troubled with that element over there. The same may be said for England, and on looking over the new pig iron contract issued by the London Metal Exchange we find that while the sulphur allowed is not much greater than ours yet the very much higher silicon that goes with it practically makes a big difference. Thus, while we have a No. 2 pig iron run 2.25 silicon, with a variation of 10 per cent. either way, or 2.00 to 2.50, and this has a maximum of 0.045 sulphur allowed, the English standard with the same sulphur allows the silicon to vary from 2.50 to 3.50 per cent., which would correspond to our No. 1, with a higher sulphur. The English specifications also give rules for sampling, but lay much stress upon the brand names.

Incidentally it may be mentioned that the United States is taking up the question of standardizing foundry

* A paper read at the Atlantic City meeting of the American Society for Testing Materials, June, 1905.

coke, which is a step in advance and will have a far reaching influence not only in foundry practice but on the blast furnace.

Specifications for Cast Iron.

To turn now to specifications for testing cast iron: In the United States we have adopted a set of pipe for locomotive cylinders, for malleable castings, and there are pending those for castings in general and for car wheels. Over here we take out from the general work the special groups, which can stand by themselves and have properties peculiarly their own, which may be determined by specific tests. In Germany they have specifications for machinery castings, for columns (which we are trying to get away from as quickly as possible) and for pipe.

In dividing the classes of castings relative to their thickness—for this is the important point to consider when specifying breaking strength—we have adopted a little wider limit than the Germans. Thus we have small castings at $\frac{1}{2}$ inch and less. They have 0.6 inch and less, or a little more. For medium castings, however, we have from $\frac{1}{2}$ to 2 inches. The Germans have from 0.6 to 1 inch. For heavy castings we have over 2 inches in thickness and they have over 1 inch, which shows that our conception of heavy castings is a little different or else that German customs lay more stress on narrower limits for medium castings.

A further difference between the American and the German specifications may be found in the chemical end. We specify the upper limit for sulphur, so as to secure reasonable strength against shock. This is not looked after in the German specifications, possibly because of the difficulty in getting low sulphur irons for the foundry.

Differences in Test Bars.

The point that interests us most, however, is the method by which the metal is judged—that is, the test bars employed. Comparing the general specifications advanced for Germany with our own, now pending, we see that special pains is taken in both cases to get representative test bars, and these are not to be cast on the piece. Herein there is a distinct advance, cutting off the old coupon. The transverse test is prescribed, which agrees with our experience. The tensile test is omitted entirely in Germany, and it is to be hoped that we may follow suit in this some day also, as no good end is served when no two testing machines may agree in the alignment and grip on the specimens.

We find a radical difference in the length of the test bars used. Our own are comparatively short, and this has caused comment on the other side, our German brethren concluding that we do not lay as much stress on the transverse test as we should. We, on the other hand, believe that with the long bars in use formerly much of the sensitiveness of the transverse test is gone, for even poor iron will show good results if the test is carried out slowly and carefully. On the other hand, with a comparatively quick test on short bars the iron must be of good quality to show a good deflection and strength.

Three bars are provided by the Germans. For small castings the diameter is 0.8 inch and the distance between supports 16 inches. For the medium castings the figures are 1.2 inches diameter and 24 inches between supports. For the heavy castings the diameter is 1.6 inches and the testing distance 32 inches.

It will be noted that the German aim is evidently to get as near the size of the castings to be represented as possible, and this is to be commended in a way. However, we realize over here that the lack of homogeneity in the structure of cast iron is such an element in the problem that the records of several sized test bars are not mathematically comparable, as would be the case in steel. Hence we would not feel safe to accept the result of a long and thick bar as compared with a shorter and thinner one in order to judge whether the iron in one is better than that in the other.

While realizing that it is desirable to vary the diameter of the bars, but not the length, we reluctantly confined ourselves to one bar for all purposes, aiming only to get at the actual quality of the metal with given standard conditions, identical for each test, so far as foundry practice can accomplish this. We can therefore discriminate between metal wanted for light, medium and

heavy castings at a glance and without making a comparative calculation the results of which are open to doubt.

The German specifications for casting the test bars go us one better in requiring the vertical pour, but from bottom up. We await their results on this with interest, as we use the ordinary top pour, but so arranged that the metal drops to the bottom through a funnel shaped gate, and the mold is thus made cheaper.

German specifications call for the bars to be made in flasks that are not parted if possible, so that the test bars have no seams. If, however, this is unavoidable, the test bar is to be so placed that when tested the seam lies in the neutral axis. We prefer to prevent the making of test bars with seams altogether by giving complete specifications for the flask itself, which any foundry can arrange for without particular trouble.

Both specifications agree in having the bars cast in dry sand and as to the cooling of the bars in the flask. Furthermore, only brushing is allowed in cleaning the bars and no machining is to be done.

In judging the tests themselves there is a difference between the two specifications in question. We specify just when the tests are to be arranged for in the heat and that one of the two bars cast at the various casting intervals must pass the requirements. The German specifications call for three bars, the average of which must be taken, defective bars to be excluded. In both cases the expense of testing falls upon the founder. In our added tensile test this when required by the purchaser is to be paid for by him.

The clause in our specifications wherein we allow the buyer the freest run of our establishments in order that he may be satisfied that the material is gotten out in the best manner possible does not appear in the German specifications. Only in the case of pipe is there mention made of facilities to be given the inspector to watch the testing of this material.

Evidence of Marked Advance.

It is still a little early to draw conclusions from the specifications advanced, for they have either not been officially adopted by their respective countries or they are still in the trial stage. This much can be said, however, that a marked advance can be recorded, for in everything presented so far the attempt has been made to build on our increasing knowledge of the properties of cast iron as a metal. Much has of course to be yielded to business expediency, for the industrial customs of a nation cannot be radically disturbed without laying ourselves open to the charge of being idealists and dreamers.

The buying of pig iron by analysis and not by specification may be said to be the most radical advance the foundry has ever made. The adoption of specifications for castings is gradually coming into vogue also, and we will soon see the allied industries such as the fuel, sand, facings, &c., become a subject for study and final specification.

It is to be hoped that at Brussels next year we not only may report final specifications for all we have undertaken in the way of cast iron, but that Germany, England, France and Austria may be similarly situated. Then we can compare notes and possibly adjust some of the items so as to have a greater conformity in practice.

The Pennsylvania Railroad Company, in connection with the improvement of its terminal facilities in South Buffalo, immediately adjoining the property of the Buffalo & Susquehanna Iron Company, has acquired a large tract of land northwest of its present holdings, which it will cover with tracks, immense iron ore bins and coal trestles equipped with the most approved apparatus for the rapid and economical handling of iron ore and coal. It is the company's intention to make its Buffalo terminals among the most comprehensive and complete of any on its entire system. A second ship canal will be constructed from the harbor to the new tract. The ship canal recently completed, which is owned jointly with the Buffalo & Susquehanna Iron Company, is not sufficient for traffic requirements.

Productive Capacity of Iron Heavily Reduced.

Merchant Stocks Increased 68,000 Tons.

Production of Pig Iron During First Half of 1905 Was 11,200,000 Tons.

The record of the first six months of the current year shows a production of coke and anthracite pig iron of 10,994,500 gross tons, which was carried to about 11,200,000 gross tons by the make of the charcoal furnaces, for which monthly returns are not available. This compares with the record of 9,707,367 gross tons for the first half of 1903 and with 8,173,438 tons during the first half and 8,323,595 tons during the second half of 1904.

A very striking fact is brought out by a study of the figures so far as they relate to the production of the steel companies and the apparent consumption of the metal made by the merchant furnaces as they are tabulated by us from month to month.

Examining the figures for half yearly periods we find the following:

	Production of steel companies.	Consumption of merchant product.
	Gross tons.	Gross tons.
First half 1904.....	4,863,028	3,090,124
Second half 1904.....	5,332,628	3,183,214
First half 1905.....	7,048,786	3,878,517

The jump from 4,863,000 tons in the production of the steel companies in the first half of 1904 to 7,048,786 tons in the first half of the current year does not even reflect the contrast fully, because during the greater part of the latter period the steel companies purchased very considerable quantities of merchant iron.

It is obvious that the general foundry trade, as reflected in the apparent consumption of merchant iron, is very much more uniform, and that really the improvement during 1904 and during the first half of 1905 was far less striking than would appear from the gain of 700,000 tons.

The effort has been made to minimize the effect of an accumulation of stocks in the hands of the merchant furnaces, which alone are reported. We have heard the scornful exclamation, "What is a stock of 400,000 tons in a production of 2,000,000 tons a month?" As a matter of fact the stock refers not to the total production, but to the 650,000 to 700,000 tons a month made by the merchant furnaces alone. With very few exceptions the steel companies carry very little stock of iron, and we doubt very much from partial returns whether the enormous make of about 1,200,000 tons per month is backed by a stock of 250,000 tons. But even among the plants rated as merchant furnaces there are a number who supply mills and foundries directly under the same management and there are some which are under contract for their output to steel companies. The returns of the amount of stock on hand are much more significant than some economic writers affect to believe, and close attention is paid to them by the trade.

There is of course that unknown element, the stocks in consumers' yards, which probably emphasizes at times the movement of stocks. It is pretty thoroughly understood that, for instance, at this juncture consumers' stocks are at a very low ebb, so that the furnaces are carrying as a visible supply metal which ordinarily would not be counted.

During the current year the iron industry of this country has proved its ability to produce close to 2,000,000 tons per month and has made the record in March of consuming pig iron at that enormous rate.

The developments during the past 18 months have shown how rapidly our iron producers adjust themselves to changed conditions, and it is a significant fact that the United States Steel Corporation in particular increases and decreases its output of metal very closely to the requirements. Isolated furnaces are blown in and are blown out with a freedom and at a notice so short

that it staggers some old time furnacemen. Merchant furnaces usually are not in the position to do this. In the greater part of the territory in the North the furnaces must make their contracts for raw material for long periods and must to some extent face the alternative of meeting the pig iron market or of piling iron. In the South, where the raw materials are largely mined by the companies themselves, a greater elasticity of operations is possible.

Turning to the blast furnace statistics for the first of this month, the most noteworthy fact is that the expected sharp reduction in the capacity producing has come. It did not show in the returns for June. Now, however, we have dropped down from a rate of 452,000 tons per week on May 1 to 408,600 tons on July 1. It must be noted, however, that it is chiefly the steel makers who have cut down their make.

The statistics of production given in the following table are compiled from the official reports of all the furnaces in the country except two, whose aggregate output does not exceed 4700 tons per month:

Monthly Pig Iron Production.					
	February. (28 days)	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)
New York...	66,185	96,180	103,353	101,361	97,234
New Jersey..	20,487	29,292	31,353	31,317	27,879
Lehigh Valley	49,407	55,319	54,280	53,072	50,953
Schuylkill Val.	39,102	44,998	43,488	45,212	44,164
Lower Susquehanna and					
Lebanon Val.	34,161	39,590	58,090	67,131	68,731
Pittsburgh dis.	411,135	510,265	490,830	493,619	476,696
Shenango Val.	131,748	155,266	164,698	174,018	112,880
West. Penn..	96,551	97,569	96,622	110,101	106,883
Md., Va. and					
Kentucky...	62,170	78,306	70,739	67,757	71,314
Wheeling dis.	93,865	99,737	103,140	102,400	67,823
Mahoning Val.	145,590	154,140	143,428	136,773	118,138
Cent. and No.	97,638	123,438	130,733	135,447	124,601
Hocking Valley					
and Hanging					
Rock	22,094	30,539	31,388	30,993	30,483
Ill., Mich., Minn.,					
Wis., Mo. and					
Col.	199,104	253,325	234,410	247,307	233,298
Alabama	99,624	127,316	127,810	130,071	124,264
Tennessee, No.					
Carolina and					
Georgia	28,482	40,984	37,670	37,138	37,948
Totals...	1,597,343	1,936,264	1,922,041	1,963,717	1,793,289

Production of Steel Companies.—Returns from all the plants of the United States Steel Corporation, the Cambria, Pennsylvania, Maryland, Lackawanna, Wheeling, Ashland, Republic, Jones & Laughlin, La Belle, Bethlehem, Calumet and Colorado companies show the following totals of product month by month. We present also separately monthly figures of the production of spiegel-eisen and ferromanganese, which is included in the total:

Production of Steel Companies.—Gross Tons.					
	—Pig.—Total production.—			Spiegel-eisen and ferromanganese.	
	1903.	1904.	1905.	1904.	1905.
January	502,994	1,129,042	6,673	21,002	
February	756,260	1,027,937	12,961	22,431	
March	913,412	1,232,255	28,128	21,280	
April	966,850	974,006	1,222,710	29,145	20,038
May	1,037,325	927,534	1,287,438	25,755	24,732
June	1,021,839	788,822	1,149,404	24,950	21,761
July	987,855	694,892	.....	27,284	.....
August	993,564	747,570	.....	19,280	.....
September	956,363	936,494	.....	20,723	.....
October	829,215	971,447	.....	13,669	.....
November	553,067	962,384	.....	13,442	.....
December	406,730	1,019,841	.....	13,325	.....

Deducting from the total monthly production the output of the steel companies we reach the following series of figures, which represent closely the make of the merchant furnaces. Taking into account the fluctuations in the stocks, we arrive at the apparent consumption from month to month:

Statistics of Merchant Furnaces.—Gross Tons.				
1904.	Production.	Stock.		Apparent consumption.
		— Decline.	+ Increase.	
January	420,657	— 21,615		442,272
February	452,151	— 45,722		497,873
March	538,005	— 71,364		609,369
April	587,081	— 13,688		600,769
May	609,461	+ 101,433		508,028
June	506,917	+ 75,104		431,813
July	515,927	+ 49,960		465,967
August	425,175	— 39,743		464,918
September	421,348	— 73,883		495,231
October	483,823	— 26,656		510,479
November	524,221	— 70,198		594,419
December	596,400	— 55,760		652,200
Totals.....	6,081,166			6,273,339

1905.			
January	652,805	—	26,594
February	569,406	—	25,694
March	704,009	—	31,489
April	690,331	+	17,392
May	676,279	+	63,500
June	643,885	+	70,084

These figures indicate a marked falling off in the apparent consumption, against which, however, must be taken into account the invisible supply in the hands of consumers.

The status of the coke and anthracite furnaces was as follows:

Coke and Anthracite Furnaces in Blast.					
Location of furnaces.	Number of stacks.	July 1. Number in blast.	July 1. Capacity per week.	June 1. Number in blast.	June 1. Capacity per week.
New York:					
Buffalo	11	9	17,661	10	19,196
Other New York	11	4	3,697	4	3,692
New Jersey	8	5	4,440	6	6,879
Spiegel	2	1	194	1	192
Pennsylvania:					
Lehigh Valley	27	19	11,954	18	11,862
Spiegel	2	2	402	2	321
Schuylkill Valley	13	9	9,542	10	10,209
Low Susquehanna	10	6	7,452	5	7,166
Spiegel	1	1	514	1	332
Lebanon Valley	11	10	8,071	10	7,661
Pittsburgh district	39	39	108,643	39	109,162
Spiegel	3	3	2,586	3	2,646
Shenango Valley	21	14	23,620	19	39,153
West. Penn.	24	18	24,706	18	24,257
Maryland	5	3	5,745	3	5,849
Wheeling district	13	8	14,157	10	22,628
Ohio:					
Mahoning Valley	16	13	27,565	13	28,490
Cent. and North	18	12	29,011	15	31,198
Hocking Valley	2	1	273	1	350
Hanging Rock	10	9	6,839	9	6,998
Illinois	21	18	39,200	19	41,576
Spiegel	1	1	1,382	1	1,378
Minnesota	1	0	0	0	0
Wisconsin	5	5	4,891	5	5,632
Missouri	1	0	0	1	900
Colorado	4	3	6,797	2	5,800
Spiegel	1	0	0	1	700
The South:					
Virginia	23	14	10,500	13	9,326
Kentucky	8	2	1,102	2	1,314
Alabama	45	27	29,218	26	29,838
Tennessee	16	14	8,435	14	7,410
Georgia	1	0	0	1	977
North Carolina	1	0	0	0	0
Totals	375	270	408,617	281	448,092

For a series of months the active anthracite and coke furnace capacity fluctuated as follows in gross tons:

	Capacity per week.		Capacity per week.
July 1, 1905	408,617	September 1	360,197
June 1	443,092	August 1	353,681
May 1	452,031	July 1	384,825
April 1	439,564	June 1	388,178
March 1	403,157	May 1	373,496
February 1	405,792	April 1	386,215
January 1, 1905	377,879	March 1	347,424
December 1, 1904	357,846	February 1	335,339
November 1	334,249	January 1, 1903	346,073
October 1	319,249	December 1, 1902	336,617
September 1	291,573	November 1	330,110
August 1	246,092	October 1	337,837
July 1	272,301	September 1	328,243
June 1	336,197	August 1	328,745
May 1	368,244	July 1	303,793
April 1	337,257	June 1	337,492
March 1	308,751	May 1	337,627
February 1	273,692	April 1	331,140
January 1, 1904	185,636	March 1	316,039
December 1, 1903	244,156	February 1	325,440
November 1	273,715	January 1, 1902	291,992
October 1	353,142		

Among the furnaces which were blown out during June are one Niagara in the Buffalo district, one Wharton in New Jersey, one Warwick in the Schuylkill Valley, four Newcastle and Stewart in the Shenango Valley, Riverside and Top Mill in the Wheeling district, two Columbus and Franklin, Steelton and Zanesville of the Carnegie Steel Company in Ohio, one of the old South Chicago plant in Illinois, Missouri, one Allen's Creek in Tennessee and Rising Fawn in Georgia. There were started in June one Brooke in the Schuylkill Valley, one Hokendaqua of the Thomas Iron Company in the Lehigh Valley, one Paxton in the Susquehanna, Cleveland and Dover in Ohio, Crozer in Virginia, one Clifton in Alabama and Johnson City in Tennessee.

Stocks.

Believing that a classification of the merchant stocks by general geographical conditions would aid in a correct appreciation of the situation, we have arranged them in three groups. The stocks, of course, do not include the holdings of the steel companies.

Merchant Furnace Stocks.					
	March 1.	April 1.	May 1.	June 1.	July 1.
East	79,996	68,912	70,740	76,242	87,852
Central and North-west	135,861	116,967	115,791	150,249	188,916
South	134,889	133,378	150,118	173,658	193,465
Totals	350,746	319,257	336,649	400,149	470,233

The principal increases have taken place in western Pennsylvania and in Ohio. Alabama leads in the South, Virginia and Tennessee following with smaller amounts.

NEWS OF THE WORKS.

Iron and Steel.

The Kidd Brothers & Burgher Steel Wire Company, Allquippa, Pa., is building an addition, 60 x 100 feet, to its wire mill and will install a number of wire drawing machines of its own design. When these additions have been completed the company will have an annual capacity of about 900 tons of fine tool steel wire.

The Humbert works of the American Sheet & Tin Plate Company, at Connellsville, Pa., which have been closed for some time, will resume operations about July 15.

At the annual meeting of the National Rolling Mill, Vincennes, Ind., directors were chosen as follows: G. R. Bell, Hartford City; E. B. Mitchell, Lima, Ohio; J. H. Jones, S. N. Bradshaw, H. J. Broeckman and C. B. Kessinger, Vincennes. Officers elected were: E. B. Mitchell, president; G. R. Bell, vice-president; J. H. Jones, secretary-treasurer. The company had a prosperous year, increasing the number of its employees to 400, with a monthly pay roll of \$16,000. A dividend of 3½ per cent., semi-annual, was declared.

The American Iron & Steel Mfg. Company, manufacturer of bar iron, nuts, rivets, &c., Reading, Pa., has just completed the erection of a new rolling mill at its Central Works, consisting of a 12-inch and 9-inch train of rolls running tandem, supplied by two coal or gas furnaces. All the equipment of this mill is strictly up to date and capable of turning out a large tonnage of iron and steel rods and bars. Most of the capacity of this mill will be consumed in the company's own works at Lebanon. The mill was put in operation on July 10.

We are informed by Frederick H. Foote, president and owner of the Spring Valley Iron & Ore Company, Spring Valley, Wis., that the blast furnace of that company has been blown out to permit the installation of three new hot blast stoves of a modern type and the completion of other large improvements. John Mohr & Son, Chicago, will furnish the iron work. It is thought that these improvements, which will very greatly enlarge the capacity of the Spring Valley plant, will be completed early in October.

The 84-inch plate mill under erection for several months by the La Belle Iron Works, at Steubenville, Ohio, is about finished and will be started up on July 20. The concern is now soliciting plate orders for this mill. The mill with its equipment of tables and other appliances was built by the United Engineering & Foundry Company, Pittsburgh, instead of Mackintosh, Hemp-hill & Co., as stated in these columns last week.

General Machinery.

Heyl & Patterson, Pittsburgh, have received a contract for the building of a new coal tippie for the Canadian Northern Railway Company at Fernie, British Columbia. The structure will be entirely of steel, fitted in the factory, and the material will weigh over 800 tons. It will be 30 feet wide, will extend across a valley a distance of 900 feet, and will have a capacity for 4000 tons a day. It will be fitted with tippie machinery furnished by the Phillips Mill Supply Company, Pittsburgh.

The Fischer Machine Works, Company, Leavenworth, Kan., is making excavations for a \$25,000 foundry and machine shop to be run in connection with its present plant on Cherokee street. A railroad switch will enter the buildings to facilitate the loading and unloading of heavy materials, and two electric cranes of 15 tons capacity each will further aid in the movement of heavy pieces.

The Dresden Machine Company, Dresden Ohio, has been incorporated with a capital stock of \$10,000 to take over the business of the Dresden Machine Works, formerly operated by F. M. Walker. Improvements will be made by the addition of a foundry and new machinery. Incorporators of the company are E. A. Schenck, H. A. Walker and C. S. Littick.

The Chicago Digger & Mfg. Company, 154 Lake street, Chicago, will either purchase or erect a foundry and machine shop, both for the fabrication of its post hole augers and for general jobbing work.

The Krom Machine Company, 170 Broadway, New York, has purchased a tract of land adjoining the Central Railroad at Plainfield, N. J., with the likelihood of erecting a plant there in the future. It is stated that the company has no plans made as yet.

The Pennsylvania Railroad Company has let contracts to J. N. Bastress & Co. for about \$25,000 worth of new shops in Harrisburg, Pa., where the contractor has a branch office. The buildings will include a buck lathe shop 40 x 70 feet, new tool building, blacksmith and boiler shops and pits. The company has given H. E. Aherns & Bro., Reading, a contract for a building in one of the Harrisburg yards.

The Youngstown Engineering Company, Youngstown, Ohio., has received a contract for six electric cranes, to be installed in the National works of the National Tube Company, McKeesport, Pa.

The McClintic-Marshall Construction Company, Pottstown, Pa., has been given the contract to erect a new steel building, 130 x 200 feet, at Coatesville, for the Lukens Iron & Steel Company.

The Corrugated Grinding Wheel Company, Philadelphia, Pa., has incorporated with a capital stock of \$100,000 to manufacture emery and other abrasive wheels and machinery. Among the incorporators is Francis M. King, Sr.

Although the Axelsen Machine Company, Los Angeles, Cal., has bought all the machinery it requires at the present time, it is contemplating the manufacture of vertical gas engines for stationary marine and automobile purposes and later on will probably need considerable in the way of machine tools. The company is having excavations made on the lot adjoining the present works preparatory to erecting a two-story brick addition to its plant, 42 x 155 feet.

The Covington Machine Company, Covington, Va., has awarded the contracts for the erection of a brick addition to its plant, 40 x 75 feet, which will be used as an erecting shop. No new machinery is required.

Recent contracts secured by the Robins Conveying Belt Company, New York, include Semet-Solvay Company, Syracuse, N. Y., entire coal handling machinery, consisting of belt conveyors and storing and reclaiming traveling bridges of great capacity and long span for the gas plants at Chicago, Ill.; Milwaukee, Wis., and Delray, Mich. Other work in hand covers ore handling machinery for the Depue, Ill., works of the Mineral Point Zinc Company, belt conveyors and bucket elevators for the power house at the West Point Military Academy, and additional belt conveyors for handling coal at the Subway power house of the Interborough Rapid Transit Company.

Interests closely allied to the American Paper Goods Company, Kensington, Conn., have established a new industry known as the Mattabassett Machine Company, which, it is understood, will manufacture some sort of machinery, though the American Paper Goods Company states that it is not yet ready to make announcement of what the product will be and that the new company is not at present looking for outside business. No new machinery will be required at present.

The Prentice Bros. Company, Worcester, Mass., manufacturer of drills and engine lathes, suffered a serious loss of several thousand dollars and much inconvenience by a fire which partially destroyed its pattern storehouse last week. Many of the destroyed and damaged patterns were those in present use, while others were special patterns.

The E. G. Wallof Machine Works, Minneapolis, Minn., is having plans drawn for a new machine shop and factory building, which will be 33 x 110 feet, three stories in height.

The Morse Iron Works, recently incorporated at Erie, Pa., will at once commence the erection of its shops on a site selected near the eastern city limit. At a meeting of the directors held last week the following officers were elected: President, William Hamilton; secretary, Arthur Brevillier; treasurer, George Schaal; vice president and general manager, Thomas G. Morse.

Power Plant Equipment.

Active building operations in LaGrange, Ill., a suburb of Chicago, are responsible for extensive improvements in the public utilities of that town. The LaGrange Service Company is thoroughly overhauling its works, bringing electricity from Maywood, where it is building a large power house. The LaGrange light and water plant will also be improved, and Sargent & Lundy, Chicago, will prepare plans for a model power house in three or four weeks, when Mr. Sargent is expected to return from California. Pumps will be operated by electric power. An extra 150 horse-power boiler and engine will be installed to be used in case of accident to the electrical supply received from Maywood.

The Minnesota Power & Trolley Company, Minneapolis, Minn., is having preliminary plans prepared by F. W. Cappelen, Globe Building, for a power house and a 30-foot dam across the Mississippi River at Otsego, Minn.

The Cowles Engineering Corporation, New Haven, Conn., has been incorporated with a capital stock of \$50,000 to repair engines by means of new and original methods, which have been patented. Henry G. Newton is president; B. S. Cowles, vice-president, and L. E. Pangburn, secretary and treasurer.

The Evansville Gas & Electric Light Company, Evansville, Ind., is planning to erect a plant to supply power to various traction lines.

The New Way Motor Company, Lansing, Mich., is erecting a modern factory building 45 x 330 feet. Last year the company spent considerable time developing its stationary air cooled gasoline engine, of which two sizes will be made, one giving 3 to 3½ horse-power, which is a single cylinder vertical engine, and the other a two-cylinder horizontal opposed engine of 6 to 7 horse-power.

The Green & Sons Company, Appleton, Wis., was awarded contract by the city of Manistique, Mich., on the following water works equipment: Two triplex power pumps of 500,000 and 750,000 gallons capacity each, together with the necessary belting to drive the pumps from the present water works plant.

Contracts were let as follows by the city of Belding, Mich., for water works equipment: One 1,000,000-gallon pumping engine, Laidlaw-Dunn-Gordon Company, Cincinnati, Ohio; one 100,000-gallon water tower, Kenwood Bridge Company, Chicago; two 100 horse-power boilers, Shaw Kendall Engineering Company, Toledo, Ohio; 1140 tons of cast iron pipe and special castings, United States Cast Iron Pipe & Foundry Company, Chicago; hydrants, Darling Hydrant Company, Williamsport, Pa.

The Bernold Electric Light & Power Company, Hillsboro, Ill., has purchased a 40-kw. alternator from the Fort Wayne Electric Company, Fort Wayne, Ind.

The Valley Junction Water & Light Company, Valley Junction, Iowa, recently incorporated to operate a water and light plant, has purchased a 250 horse-power Corliss Bates engine and a 140-kw. generator, with heater and pump.

John R. Warren & Co., Indianapolis, Ind., have secured the contract to build the power house and buildings of the Indiana Industrial School for Girls in that city for \$174,000. Bids will be asked for a heating plant. Address E. M. Johnson, secretary of committee.

The Poseyville Electric Light & Power Company has been organized and incorporated at Poseyville, Ind., with \$10,000 capital stock. The company will construct a plant.

The City Council of Waukesha, Wis., has taken preliminary steps toward acquiring for the city a municipal water works system. A private corporation at present holds a contract from the city, and there is a disposition to allow that contract to expire and construct a new plant to be owned and operated by the city. There is some talk of acquiring by purchase the present plant, although the City Council apparently favors the construction of a new system, and has instructed the Board of Public Works to draft specifications for the construction of water works and advertise for bids.

According to General Manager Sloat of the Cincinnati Northern Traction Company, Hamilton, Ohio, the central power house that is to be erected in that city will cost \$700,000. There will be three turbo-generators of 1000 kw. capacity each, and three 300 kw. rotary converters. There will be four substations.

Bridges and Buildings.

The Wm. J. Oliver Company, Knoxville, Tenn., was recently awarded contract at about \$75,000 for the construction of the West Clinch avenue viaduct at Knoxville. The structure will be of concrete with steel reinforcement, erected after plans drawn by Edwin Thacher of the Concrete Steel Engineering Company, New York.

Chas. E. Lancaster, Columbia City, Ind., Auditor of Whitley County, will receive bids until July 25 for the construction of three steel bridges, concrete and stone abutments, &c.

The city of Gardiner, Maine, will build a new steel draw-bridge spanning the Kennebec River between that city and Randolph, the work to begin with the freezing over of the river in the fall.

Foundries.

The El Paso Foundry & Machine Company, El Paso, Texas, contemplates removing its plant from the present site to a location in East El Paso, where it has purchased a site of 20 acres, but it is probable that it will be several years before the plant is moved. The company has just completed a new pattern shop, 83 x 120 feet, at a cost of \$10,000.

The Reed Foundry Company, Worcester, Mass., has purchased a tract of land containing 28,000 square feet, adjacent to the company's present holdings, the purpose being to secure ample yard room and to provide for necessary additions in the future.

The National Cast Steel Company, Avonmore, Pa., has elected the following officers: Homer T. Chase, president; Ira C. Ewing, vice-president; Lyman Alles, secretary, and C. M. Hine, treasurer. The concern makes steel rail fasteners.

Fires.

The plant of the P. Kersaus Russet Leather Mfg. Company, at Danversport, Mass., was destroyed by fire July 8. The loss is placed at \$100,000.

The plant of the Moore-Jonas Glass Company, at Bridgetown, N. J., was partly destroyed by fire July 4. The loss will reach nearly \$100,000.

On July 7 a fire wrecked the large piano factory of Wing & Sons on the three-sided block bounded by Hudson street, Ninth avenue and Thirteenth street, New York. The loss is estimated at \$400,000.

The Tannery of the Widen-Lord Leather Company, Foxboro, Mass., was burned July 4, with a loss of \$100,000.

The Rockdale Powder Works, at Hoffmansville, Baltimore County, Md., was partially wrecked by an explosion July 10.

The pattern department and core room of the Dayton Malleable Iron Works, Dayton, Ohio, were destroyed by fire last week. Loss is about \$125,000.

Hardware.

The Michigan Heater Company, Big Rapids, Mich., has commenced rebuilding the plant which was destroyed by fire last winter. The building when completed will be leased by the Han-

chett Swage Works, Big Rapids, that company finding its present quarters too small for its growing business. The Hanchett company is now putting on the market an automatic band saw sharpener, adjustable saw swage and a swage shaper.

The annual meeting of the shareholders of the Imperial Steel & Wire Company, Limited, was held at Collingwood, Ont., on June 20. During the past year the company's plant has been completed and in February last was placed in commission and since that time it has been running steadily night and day. Owing to the large amount of business offering it was decided at a recent meeting of the Board of Directors to double the capacity of the works immediately, making the output 50 gross tons per day, which action was heartily approved by the shareholders. An additional boiler of 150 horse-power has already been installed, and engines and machinery will be ordered at once. The company will also install a galvanizing plant during the coming year, and in August it expects to be producing wire fencing. The company paid its first interim dividend on June 1.

The Keller Mfg. Company, Sauk Centre, Minn., has purchased a 15-acre tract of land at Minneapolis, upon which will be erected a large plant. It is intended to dismantle the factory at Sauk Centre, removing all equipment to Minneapolis. The company manufactures wagons, trucks, sleighs, harrows, cultivators and other agricultural implements.

Miscellaneous.

Arrangements are being perfected by the Las Filipinas Fiber Factory at Sabinas, Coahuila, Mexico, to double its capacity. The company manufactures twines, baggings, ropes, wrappings for cotton and other materials, carpets, &c., and has a capacity at the present time of over 7 tons of fiber a day. Several extracting machines are now being made special in the United States for cleaning all classes of lechugilla, maguey, palma and sisal hemp leaves. These machines are of the Prieto style, patent on which is owned by the Las Filipinas interests for all States of Mexico except Yucatan and Campeche. The machines weigh about 12 tons each and will clean 300,000 leaves of Palma de San Pedro per day. The company owns extensive fiber lands on the International and the Mexican Central railways, and the output of fiber produced will supply not only home consumption but will leave considerable for export. Machinery for spinning and weaving has been contracted for and part of it already shipped. The Las Filipinas Company is capitalized at \$950,000, with an additional and optional capital of \$250,000 put up by two stockholders.

The United States Radiator & Boiler Company, Pittsburgh, has purchased the plant of the Penn Radiator Company, Corry, Pa., and will start it up at an early date. The capital of the United States Radiator Company will be increased from \$300,000 to \$500,000, the \$200,000 new stock being taken by the present stockholders. This will provide funds for paying for the Corry plant and also ample working capital.

The Brunn Axle Company has been incorporated at Buffalo, N. Y., with a capital of \$100,000. The directors are Henry Brunn and W. F. Hurd of Buffalo, and F. W. Burdick of Hartford, Conn.

The plant of the defunct Southern Car & Foundry Company, at Gadsden, Ala., has been purchased by the Alabama Great Southern Railroad Company of the Queen & Crescent Route. The company is not yet ready to announce the purposes for which it will operate the plant.

Edward W. Coffin, Worcester, Mass., manufacturer of store fixtures, has purchased land on Central street in that city and will erect a factory building on the site, to be about 50 x 80 feet and two stories. He will remove his business to the new shop as soon as it is completed. He will need no new machine equipment for the present, but later on may require a few new tools. He will operate the plant by electric motor, purchasing his power from the local electric light company.

The New State Steel Company, South McAlester, I. T., intends erecting a new warehouse to accommodate its rapidly growing business. It will have a frontage of 150 feet, depth of 120 feet and be four or possibly five stories high. In addition to this construction the company has a yard room of 350 feet frontage by 160 feet, in which will be built numerous sheds for storage of heavy material requiring less protection. The main warehouse building will be up to date in every respect, equipped with electric elevators and electric lights, and will be fire proof. Railway tracks will enter the building and yard. The improvements to be made and the stock which it is expected to carry when they are completed will approximate in value \$500,000. The stock will include a full line of heavy hardware and tools, machinery, wagon and carriage material, mill and machine supplies, wire goods, iron and steel, pipe, fittings, &c. The company estimates sales for the current year at \$1,000,000.

The United States Mica Mining & Milling Company, Railway Exchange Building, Chicago, contemplates an extensive enlargement of its plant at Micanite, Col. The company is now manufacturing mica for electrical purposes, sheet mica for stoves and mica-flake lubricant. This latter product puts to profitable use materials that would otherwise be waste, and the company is building up a large trade among railroads and users of heavy machinery for this lubricant.

D. W. Thomas & Co., Fargo, N. D., are erecting a factory for

the manufacture of the Fargo incandescent gas machine, on which the company owns patents. A department will also be established devoted to the manufacture of sheet metal work of all kinds, steel ceilings, roofing and steam and hot water heating.

The Wayne General Construction Company has been incorporated at Fort Wayne, Ind., to build and equip railroads and gas and electric plants. George W. Beers, Fort Wayne, is at the head of the enterprise.

The Angola Furnace Company, Angola, Ind., has increased its capital stock from \$20,000 to \$100,000. George E. Crawford is secretary.

J. G. Schmidt, owner of the Lodi Artistic Wrought Iron Works, Lodi, N. J., has purchased a plot of ground on the Erie Railroad in Passaic, where he will build a new shop and equip it with the tools in his present shop.

The Springfield Tire & Rubber Company, Springfield, Ohio, is sending out a folder giving the list prices and dimensions of the Springfield abrasive polishing wheels and blocks. These wheels and blocks are intended solely for putting a high polish on metal, after the roughness has been taken off with an all emery or carborundum wheel. The rubber that is in the compound acts as a sort of cushion and keeps the emery or carborundum from scratching or marring the surface.

A large manufacturing concern represented by H. A. Cuppy, an official of the Public Opinion Company, New York, has purchased 50 acres of land at Stamford, Conn., as a site for a new plant. It is understood that the plans, which have been completed, call for a main building 200 x 500 feet and several smaller buildings. The identity of the company which is to occupy this plant has not been made public.

OBITUARY.

JOEL TURNEY, founder and senior member of the wagon manufacturing firm of Joel Turney & Co., Fairfield, Iowa, died June 27. Mr. Turney was born near Columbus, Ohio, June 15, 1827.

LEVERETT L. HULL, senior partner in the firm of Hull & Co., wholesale coke and coal, Chicago, died July 8 of heart disease. Mr. Hull was born in Cincinnati in 1867 and with Howard Tracy formed, in 1894, the firm of Hull & Co., buying out the old house of George H. Hull & Co. of Louisville. The office of the firm was moved to Chicago in 1895. Mr. Hull was a bachelor.

ARTHUR LATHAM PERRY, the well-known teacher, historian and political economist, died at his home in Williamstown, Mass., July 9, after an illness of 12 years. After serving as a member of the faculty of Williams College for 40 years he resigned in 1893, his health having broken down from overwork. Professor Perry will be recalled by many manufacturers as an ardent champion of free trade and his work on political economy was widely used as a text book. He is survived by a widow and six children. Among the latter is Walter Perry of the Farrel Foundry & Machine Company, Ansonia, Conn.

New York Pig Iron Warrant Market.

The sales of pig iron warrants in the Produce Exchange during the week ending at noon Wednesday were somewhat above the record of the previous week, but were not large. They amounted to about 700 tons, of which 100 tons of July regular sold for \$14.40 and 100 tons of July foundry went for \$14.80; 100 tons of August regular brought \$14.25 and August foundry brought \$14.60. Other sales were 100 tons October regular, \$14.20; 100 tons October foundry, \$14.60; 100 tons February foundry, \$15.25. The following prices were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	\$14.00			
July	14.00		\$14.50	\$15.25
August	14.10		14.60	15.00
October	14.15	\$14.60	14.50	15.10
November	14.00		14.50	15.10
December	13.75	14.50	14.50	15.10
February	14.25	14.75	14.75	15.25

The Water Department of Brooklyn, N. Y., has announced the plans for the expenditure of \$3,390,000 recently allowed by the Board of Estimate for the improvement of Brooklyn's water supply. The first work to be done is the replacement of brick conduits by 60-inch steel pipe. The Ridgewood and Mt. Pleasant engine houses will be remodeled at a cost of \$650,000 and \$200,000 will be spent in extending the distributing system.

The International Steam Pump Company.

The sixth annual report of the operations of the company and of the associated companies for the year ended March 31, 1905, has just been issued. It is in part as follows:

The constantly increasing demand for the products of the company has taxed the various manufacturing plants to their utmost capacity, so that they were unable to reduce the amount of unfilled orders on hand. On March 31, 1905, the unfilled orders on the books of the company amounted to \$4,510,000.

Considerable time and money have been spent in the development of the centrifugal and turbine pumps,* gas engines and water meters, and satisfactory progress has been made in the manufacture of these special lines.

The engineering and manufacturing departments have made many improvements in the quality and efficiency of the standard pumps and have applied for letters patent covering a great many new designs and devices which have been made to meet novel conditions.

The year just closed has marked the transfer of the Henry R. Worthington plant from Brooklyn and Elizabethport to Harrison, N. J. The moving of these works occupied several months and occasioned a very considerable interruption in the business, so that there was a large falling off in the production and shipments. The loss in production, together with the moving and other expenses incidental to the starting of the new plant, has resulted in a decrease in the profits.

The new works at Harrison, N. J., are now practically completed and in full operation. This plant was designed with a view to economy and efficiency and now stands unsurpassed in its adaptability to the manufacture of pumping and hydraulic machinery.

The removal of the operations of the Holly Mfg. Company from the Lockport plant to the enlarged Snow plant at Buffalo was also finally completed early in the fiscal year, and the Lockport plant is now unoccupied and to a large extent dismantled. The machine tools, &c., belonging to the Holly Company are, however, independently maintained and segregated within the Snow plant at Buffalo.

At the other plants such new tools as have been made necessary by modern and economical methods of manufacture have been installed, thereby solving the problem of concentrating, centralizing and standardizing the production of the company.

Since the organization of the company in 1899 there has been paid and distributed in redemption of bonds and in interest and dividends on the securities of the company and its constituent companies a total of \$7,113,153.95, and \$6,082,976.68 for new buildings and improvements, making a total of \$13,196,130.63. The benefits of these improvements are expected to be hereafter reflected in the economy and increase of production.

The consolidated balance sheet of all the companies as of March 31 compares as follows with that of the previous year:

Assets.			
	1905.	1904.	Increase.
Real estate, buildings, equipment, investments, patents, good will, &c.....	\$26,358,218	\$24,983,471	\$1,374,747
Discount on bonds.....	174,903	187,403	*12,500
Inventories.....	4,633,486	4,092,757	540,729
Accounts and bills receivable	3,408,918	3,385,464	23,454
Associated company balances	16,620	30,613	*13,993
Cash.....	121,698	184,631	*62,933
Miscellaneous.....	133,094	147,831	*14,737
Totals.....	\$34,846,937	\$33,012,170	\$1,834,767
Liabilities.			
Common stocks.....	\$12,287,300	\$12,287,300	.....
Preferred stocks.....	11,335,000	11,335,000	.....
Bonds and debentures.....	3,960,965	4,033,050	*\$72,085
Surplus capital.....	1,116,399	1,116,399	.....
Reserve from sinking fund..	147,105	64,384	82,721
Notes payable.....	2,305,000	649,375	1,655,625
Trade accounts.....	906,070	635,131	270,939
Miscellaneous.....	213,760	205,461	8,299
Unpaid dividends.....	195,117	255,536	*60,419
Reserve for completion of contracts.....	128,190	145,541	*17,351
Surplus.....	2,252,031	2,284,993	*32,962
Totals.....	\$34,846,937	\$33,012,170	\$1,834,767

* Decrease.

The income account, with comparisons for 1904, as given by the *Journal of Commerce*, is as follows:

	1905.	1904.	Decrease.
Profits from mortgage and trading.....	\$1,617,435	\$1,827,430	\$209,995
Other income.....	124,147	109,308	*14,839
Total income.....	\$1,741,582	\$1,936,738	\$195,156
Interest, discount, &c.....	82,276	36,065	*46,211
Balance.....	\$1,659,306	\$1,900,673	\$241,367
Depreciation.....	516,371	294,056	*32,315
Balance.....	\$1,332,935	\$1,606,617	\$273,682
Interest funded debt.....	334,499	304,512	*29,987
Balance.....	\$998,436	\$1,302,105	\$303,669
Preferred dividends.....	709,800	709,800	.....
Balance for common.....	\$288,636	\$592,305	\$303,669
Common dividends.....	306,597	490,661	184,064
Deficit.....	\$17,961	Sur.\$101,644	*\$119,605
Previous surplus, less adjustments.....	2,269,993	2,183,349	*86,644
Total surplus.....	\$2,252,032	\$2,284,993	\$32,961

* Increase.

The changes in the capital assets account arise mainly from expenditures made for the additional cost of the new plant at Harrison and for improvements and additions at other plants, showing a total expenditure during the year for these purposes of \$1,868,157.77. The unused plants, with the exception of that at Elizabethport, are now available for sale, and adjustments of the capital value represented by these assets will be made when all are disposed of. In the meantime, however, the only adjustment so far made is a credit on account of the proceeds of the Elizabethport plant which has been disposed of.

Since the close of the fiscal year \$1,000,000 of the debentures have been sold at par and accrued interest and the proceeds devoted to the reduction of the floating debt.

The present executive officers are as follows: President, John W. Dunn; first vice-president, Marcus Stine; second vice-president, Chas. L. Broadbent; treasurer, Max Nathan; secretary, Alfred Nathan.

The Board of Directors is composed as follows: John E. Borne, Charles L. Broadbent, Edmund C. Converse, John W. Dunn, Benjamin Guggenheim, James B. Haggin, Harry K. Knapp, Philip Lehman, Cord Meyer, Alfred Nathan, Max Nathan, Daniel O'Day, Jacob Rubino, Marcus Stine and Samuel Untermyer.

The executive offices, sales offices and purchasing department are located at 114-116-118 Liberty street, New York City.

The Imperial Steel & Wire Company, Limited.

TORONTO, CANADA, July 10, 1905.—The Imperial Steel & Wire Company, Limited, Collingwood, intends to enlarge its plant during the present summer, bringing its capacity up to 50 tons of wire per day. Work on the buildings for the additional plant has been commenced. The buildings will consist of a fence mill, 60 x 200 feet, two stories; galvanizing building, 40 x 250 feet, and warehouse, 100 x 200 feet. The additional machines to be installed will consist of a 250 horse-power water tube boiler and a compound condensing engine of 150 horse-power to drive a 100-kw. generator. This generator will be used to drive the nail mill, with 40 tons daily capacity; wire fence mill, with 10 tons daily capacity, and galvanizing plant, 10 tons per day capacity. The company will install the very latest devices in motors and silent chain drive in the transmission of its power and the operation of its machines. The expenditure on the additional plant will run close to \$100,000.

The plant has been in operation six months and has been running steadily night and day since steam was turned on, and the profits have been sufficient to warrant the directors in putting the preferred stock on a dividend basis. The plant is now booked ahead for four months.

Major J. A. Currie, the president of the company, installed a modern shop cost system in the works when operations commenced, and the plant is claimed to be the most modern of its class in America. Builders of machinery of the above specified classes should communicate with the president, 608 Temple Building, Toronto, Canada.

The Iron and Metal Trades

The monthly statistics of Pig Iron collected by *The Iron Age* show some interesting facts. Production of Coke and Anthracite Pig fell off from the record of 1,964,000 tons in May, a month of 31 days, to 1,793,000 tons in June, a short month. The greater part was due to the restriction of the operations of the Steel companies, whose product declined 136,000 tons, while the output of the merchant furnaces fell off only 35,000 tons.

The active capacity has undergone a sharp decline, having receded from 443,092 tons on June 1 to 408,617 tons on July 1.

The statement of stock of the merchant furnaces, which refers to a monthly product ranging from 650,000 to 675,000 tons per month, shows a further accumulation of 70,000 tons in June, added to 63,500 tons in May and 17,400 tons in April. During the last quarter, therefore, the stocks in the hands of merchant furnaces have accumulated to the extent of 151,000 tons, against a reduction in stocks during the first quarter of 83,800 tons. As an offset there must be considered the undoubtedly considerable decline in the unknown stocks in the yards of consumers, of the foundries and of the mills.

The records of the past few months show that while the Iron industry possesses a wonderful capacity for adjusting itself to changing conditions it was not possible to check the headway gained during the extraordinary demand which developed in anticipation of spring. The industry is well in hand now, and consumption is proceeding at a wonderful rate, which the contemplation of the spurt in the spring should not obscure.

There are many inquiries for Foundry and Forge Pig Iron in the market, but the amount of tonnage booked continues small. There are reports of moderate lots of Low Phosphorus Pig Iron, Gray Forge and Foundry Iron being placed, but the volume has not been large enough to take weak sellers out of the market, and Southern Iron has sold on the basis of \$10.75 at Birmingham for No. 2, with reports of even lower prices.

The run of business to the Structural mills is very heavy, the American Bridge Company alone having taken 25,000 tons during the past week, the largest order being one of 6500 tons for the new building of the United States Express Company in this city.

The pressure for deliveries of Structural Material is so heavy that according to some reports orders have already been sent abroad. Premiums are being paid for prompt delivery and there is a disposition in some quarters to agitate for an advance in the base prices.

After a lull extending over some time car orders are again appearing in the market. Two Western roads are calling for 8000 Steel cars, which would require about 100,000 tons of material.

The Eastern Skelp trade is showing some signs of revival. In the West an order for 600 miles of Pipe for an oil line from Kansas to the Gulf is looming up.

In the Bar trade an interesting transaction is the sale of 2000 tons of Twisted Bars, taken by a Pittsburgh mill, for reinforced concrete.

Additional business is in sight for the Steel Rail mills, and in the Wire trade the first indications of a revival of buying have been noted.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	July 12, 1905.	July 5, 1905.	June 14, 1905.	July 13, 1904.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	\$16.00	\$16.25	\$16.75	\$14.25
Foundry Pig No. 2, Southern, Cincinnati	13.50	14.00	14.75	11.75
Foundry Pig No. 2, Local, Chicago	16.00	16.00	16.50	13.25
Bessemer Pig, Pittsburgh	14.85	14.85	15.85	12.35
Gray Forge, Pittsburgh	14.60	14.60	15.35	12.00
Lake Superior Charcoal, Chicago	16.50	16.50	17.00	14.50
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	21.00	21.00	22.00	23.00
Steel Forging Billets, Pittsburgh	24.00	24.00	25.00	.....
Steel Billets, Philadelphia	25.00	26.00	26.50	24.00
Steel Billets, Chicago	27.00	27.00	28.00	24.00
Wire Rods, Pittsburgh	32.00	32.00	33.00	28.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	13.00	12.50	12.00	9.50
O. Steel Rails, Philadelphia	15.00	15.25	15.00	11.50
O. Iron Rails, Chicago	17.50	17.25	16.50	14.00
O. Iron Rails, Philadelphia	18.00	18.00	18.50	14.50
O. Car Wheels, Chicago	14.25	14.25	14.25	10.50
O. Car Wheels, Philadelphia	14.00	14.50	15.00	11.00
Heavy Steel Scrap, Pittsburgh	14.00	13.50	13.75	10.50
Heavy Steel Scrap, Chicago	12.25	12.25	11.75	9.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.48½
Common Iron Bars, Chicago	1.45	1.50	1.50	1.30
Common Iron Bars, Pittsburgh	1.55	1.55	1.60	1.30
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.35
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh	1.50	1.50	1.50	1.32½
Skelp, Sheared Steel, Pittsburgh	1.55	1.55	1.55	1.32½
Sheets, No. 27, Pittsburgh	2.15	2.15	2.20	2.00
Barb Wire, f.o.b. Pittsburgh	2.25	2.25	2.25	2.50
Wire Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.90
Cut Nails, Pittsburgh	1.80	1.80	1.80	1.75
METALS:				
Copper, New York	15.00	15.00	15.00	12.62½
Spelter, St. Louis	5.17½	5.07½	5.10	4.75
Lead, New York	4.55	4.55	4.50	4.20
Lead, St. Louis	4.50	4.45	4.42½	4.15
Tin, New York	31.40	30.80	30.25	26.25
Antimony, Hallett, New York	13.00	12.00	11.50	7.25
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, July 11, 1905.—(By Telegraph.)

One season has ended and the next has scarcely begun. Both manufacturers and jobbers are taking their summer vacations, and it is not expected that business will be characterized by very great activity for some weeks, unless it might be in the case of Pig Iron, where the first rally in furnace prices will be the signal for a feverish demand on the part of consuming interests that have been holding off until assured that the bottom has been reached. The rally may come at almost any time and furnaces are disposed to hold off until it does come, as they realize that it is the buyers rather than the producers who are on the anxious seat. Notwithstanding this fact, one Southern producer has openly made quotations on the \$11 basis, Birmingham, and the same rate on furnaces 25c. farther north, or \$10.75 at the furnace. Meanwhile some of the larger Southern producers are satisfied to stay out of the market for prices lower than \$11.50, furnace. It is known that an unusually large tonnage for this season of the year is unbought; possibly 80 per cent. of the whole tonnage for the second half has not yet been placed and many foundrymen are short on Iron, having sold their Castings and not yet bought their Iron. Northern Irons maintain about their relative proportion with Southern, local prices ranging from 25c. to 50c. a ton higher than Southern Iron, delivered. In Finished Materials the shortage of Structural Steel and Plates is growing rather more acute than otherwise, and there is every likelihood of a prevalence of premiums before many weeks. Steel Bars, too, are moving up to a position where they are close to Plates, and leading mills are falling farther and farther behind their orders, and independents are becoming well filled with business. Iron Bars do not share this prosperity, in spite of the fact that Scrap has been advancing recently. The Bar Iron market is an enigma, some producers holding at 1.55c. and others stating that they are glad to get business at 10c. less. Sheets are weaker than they were in our

last report, as the surrender of the Amalgamated Association and cheaper Sheet Bars have both served to reduce the cost at the independent mills. In the Pipe market important contracts have been taken below the official card figures by both the leading interest and independent mills. There is no change in the situation on Boiler Tubes or Iron Pipes. In Agricultural Steel it becomes evident that users of special Steels have very generally closed their contracts up to July, 1906. Old Materials under the influence of large dealers continue to advance somewhat, though consumers are still holding off. Coke is a little higher and Chicago prices to-day are more nearly in line with the prices quoted at the ovens and at Pittsburgh than they have been. Chicago has been all year the low market in Coke, owing doubtless to the competition of local by-product Coke.

Old Materials.—It becomes more and more evident that the bulge in prices of the last three weeks has been due rather to the dealers than to the consumers of Old Materials. In other words, it is a dealers' market, and it is they and not the consumers who are bidding up prices. A reasonably large list closed last Saturday by the Santa Fé Railroad developed prices that average slightly higher than our quotations of a week ago. In some cases this company secured the maximum figures quoted below, in some cases the minimum, and in the majority of cases prices somewhere between the two. Consumers continue to hold off, taking the stand that they have sufficient supplies on hand to make them indifferent to the market. In some cases present supplies are ample, but with the majority of consumers stocks have run rather low, and it is in preparation for the buying movement which must set in that large dealers are bidding up the market, as they have been doing recently. Railroads are cognizant of the fact and some are holding their Scrap rather than placing it on the market, because they hope to secure higher prices before long. The following range of prices fairly represents the market. These prices are per gross ton:

Old Iron Rails.....	\$17.50 to \$18.00
Old Steel Rails, 4 feet and over.....	13.50 to 14.00
Old Steel Rails, less than 4 feet.....	13.00 to 13.50
Heavy Relaying Rails, subject to inspection	22.25 to 22.75
Heavy Relaying Rails, for side tracks..	19.50 to 20.00
Old Car Wheels.....	14.25 to 14.75
Heavy Melting Steel Scrap.....	12.25 to 12.50
Frogs, Switches and Guards.....	12.50 to 13.00
Mixed Steel.....	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates.....	\$16.00 to \$16.25
Iron Car Axles.....	20.50 to 21.00
Steel Car Axles.....	15.50 to 16.00
No. 1 Railroad Wrought.....	14.00 to 14.50
No. 2 Railroad Wrought.....	13.00 to 13.50
Locomotive Tires, smooth.....	14.00 to 14.50
Railway Springs.....	12.00 to 12.50
Shafting	15.00 to 15.50
No. 1 Dealers' Forge.....	10.00 to 10.50
Wrought Pipes and Flues.....	10.50 to 10.75
No. 1 Cut Busheling.....	9.50 to 10.00
Iron Axle Turnings.....	10.00 to 10.25
Soft Steel Axle Turnings.....	9.75 to 10.00
Machine Shop Turnings.....	9.75 to 10.00
Cast Borings.....	7.50 to 8.00
Mixed Borings, &c.....	7.50 to 8.00
No. 1 Mill.....	8.75 to 9.25
Country Sheet.....	7.00 to 7.50
No. 1 Bolters, cut to Sheets and Rings..	9.50 to 10.00
No. 1 Cast Scrap.....	13.50 to 14.00
Stove Plate and Light Cast Scrap....	9.50 to 10.00
Railroad Malleable.....	12.25 to 12.50
Agricultural Malleable.....	11.75 to 12.00

(By Mail.)

Pig Iron.—Evidences on every hand indicate that the turning point in the Pig Iron market is about due, and there is a possibility that before this report is printed the turn may have come and prices advanced. There is an unusually large tonnage of iron unbought at this season of the year and foundrymen everywhere have not only relatively empty yards, but have booked large tonnages of Castings for which Iron has not yet been bought. With stocks low and buyers short there is not much question as to the direction in which the market will turn when it does turn. Buyers are decidedly nervous and have their ears to the ground. Many of them go to the extent of calling up the Pig Iron agencies two or three times a day. Southern Iron is squarely on the basis of \$11, Birmingham, nearby delivery, for Birmingham product, with such furnaces as are selling at all, and some of the furnaces farther north enjoying a freight differential are not unwilling to give that away to secure immediate orders for their Irons, which rule higher in phosphorus than the Birmingham product. The price of \$11 has been looked upon by the buying trade as the bottom, and large tonnages were offered two or three weeks ago at that price, the furnaces refusing to take the business. Reports from the South indicate that production is being curtailed not only by the low prices available, but also and particularly on account of scarcity and high price of both labor and Coke. Northern Irons are unchanged in price for forward delivery and there is but little disposition to make concessions for spot shipment, such concessions when made rarely amounting to over 25c. a ton. No large tonnages have been booked, but selling in lots of from 100 to 500 tons has greatly improved, and inquiry for prices on large tonnages is very

marked. The following quotations represent current market prices for ordinary lots for delivery during July, August and September:

Lake Superior Charcoal.....	\$16.50 to \$17.00
Northern Coke Foundry, No. 1.....	16.50 to 17.00
Northern Coke Foundry, No. 2.....	16.00 to 16.50
Northern Coke Foundry, No. 3.....	15.50 to 16.00
Northern Scotch, No. 1.....	16.75 to 17.25
Ohio Strong Softeners, No. 1.....	17.30
Ohio Strong Softeners, No. 2.....	16.80
Southern Silvery, 4 to 6 per cent, Silicon	16.15 to 17.15
Southern Coke, No. 1.....	15.15
Southern Coke, No. 2.....	14.65
Southern Coke, No. 3.....	14.15
Southern Coke, No. 4.....	13.90
Southern Coke, No. 1 Soft.....	15.15
Southern Coke, No. 2 Soft.....	14.65
Southern Gray Forge.....	13.65
Southern Mottled and White.....	13.40
Malleable Bessemer.....	16.25 to 16.50
Standard Bessemer.....	16.80 to 17.05
Jackson Co. and Ky. Silvery, 6 to 8 % Silicon	18.30 to 18.55
Jackson Co. and Ky. Silvery, 8 to 10 % Silicon	20.30 to 20.55
Alabama Basic.....	15.15 to 15.65

Billets.—Local sellers of Forging Billets are still able to get \$28 to \$30 for prompt shipment from mill. It is probable that contracts would be entered into for forward delivery of large tonnages at \$22 to \$23, Pittsburgh, or \$25 to \$26, Chicago.

Rails and Track Supplies.—Business for the leading Pittsburgh mill taken in this market included one lot of 5000 tons and a number of smaller lots. Rail business is decidedly active, and a feature of the situation is that purchasers of Rails are besieging the mills for prompt shipments. With three Carnegie mills now in full operation and two or three months behind their orders, the Illinois Steel Company's mill working double turn with its books full to the end of the year, and inquiries for good tonnages in evidence, it is hard to imagine a stronger condition than exists in the Rail market. Track Supplies are similarly strong, the Illinois Steel Company being booked ahead about five months on Angle Bars and four months on Plates and Spikes. Prices on Standard Section Rails are firm at \$28, f.o.b. mill, with full freight to destination. Light Section Rails down to 12-lb. Sections are offered at \$24 to \$27 a gross ton, f.o.b. mill, while 10-lb. and 8-lb. are offered at \$28 and \$29. Angle Bars are unchanged at 1.40c. to 1.50c. Spikes are rather weak at 1.70c. to 1.75c., f.o.b. mill, in car lots, Eastern mills offering 1.70c. and Pittsburgh mills holding at 1.75c. or above. Track Bolts are quoted at 2.40c. to 2.50c., base, Square Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Material.—The Fuller Construction Company was awarded the contract for the steel work on the new American Exchange National Bank. Demand is increasing and mills are falling farther and farther behind. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76 $\frac{1}{2}$ c.; Angles, 3 to 6 inches, $\frac{1}{4}$ -inch and heavier, 1.76 $\frac{1}{2}$ c.; Angles, larger than 6 inches on one or both legs, 1.86 $\frac{1}{2}$ c.; Beams, larger than 15 inches, 1.86 $\frac{1}{2}$ c.; Zees, 3 inches and over, 1.76 $\frac{1}{2}$ c.; Tees, 3 inches and over, 1.81 $\frac{1}{2}$ c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2.10c. to 2.50c., according to quantity on hand in store or obtainable from mill.

Plates.—The local Plate mill is at least five months behind its orders and yet the demand seems to increase rather than decrease. The Plate situation all over the country is statistically strong and there is little doubt that 1905 will be a record year. Prices are unchanged and firm, as follows: Tank quality, $\frac{1}{4}$ -inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76 $\frac{1}{2}$ c.; 3-16 inch, 1.86 $\frac{1}{2}$ c.; Nos. 7 and 8 gauge, 1.91 $\frac{1}{2}$ c.; No. 9, 2.01 $\frac{1}{2}$ c.; Sheared and Universal Mill Plates, Tank quality, 6 $\frac{1}{4}$ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86 $\frac{1}{2}$ c., base, for $\frac{1}{4}$ -inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86 $\frac{1}{2}$ c.; Flange quality, 1.96 $\frac{1}{2}$ c. Store prices on Plates are as follows: Tank Plate, $\frac{1}{4}$ -inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—The surrender of the Amalgamated Association of Sheet Workers has caused the Sheet market to relapse from its recent rally and mills are now out for orders at prices that rule considerably lower than those of a week or ten days ago. Official prices are being shaded an average of about 10c. by independent interests. These official prices are as follows: Blue Annealed, Nos. 9 and 10, 1.86 $\frac{1}{2}$ c.; Box Annealed, Nos. 18 and 20, 2.16 $\frac{1}{2}$ c.; No. 27, 2.36 $\frac{1}{2}$ c.; No. 28, 2.41 $\frac{1}{2}$ c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.50c. for Nos. 18 and 20 Box Annealed, 2.65c. for No. 27 Box Annealed and 2.75c. for No. 28 Box

Annealed. Galvanized Sheets are quoted in car lots from mill at about the following prices, some mills asking a little more and some offering at \$1 a ton less: No. 10, 2.46½c.; Nos. 17 to 21, 2.81½c.; No. 27, 3.36½c.; No. 28, 3.56½c. Store prices on Galvanized Sheets are as follows: Nos. 10, 12 and 14 are selling at from 3c. to 3.10c., Nos. 22 and 24 at from 3.05c. to 3.15c., No. 27 at from 3.50c. to 3.65c. and No. 28 at from 3.70c. to 3.95c., with intermediate gauges in proportion and with customary differentials for widths and lengths.

Bars.—The tone of the Bar market is considerably improved since last week's report, and tonnages already booked by the mills in Steel Bars are so large that many of them are from one to five months behind their orders. There seems to be a likelihood that demand will continue and that the mills will be fully occupied for the balance of the year, if, indeed, there is not a shortage before the close of the winter. Iron Bars are held locally at from 1.45c. to 1.55c., the lower price being named only for business considered especially desirable. Steel Bars are unchanged at the official price of 1.50c., Pittsburgh, or 1.66½c., Chicago, though this price is still shaded somewhat locally on large tonnages, both by local mills and by holders of contracts for large tonnages bought at lower prices. However, this latter feature is growing less prominent and will, it is thought, soon disappear. Hoops are unchanged at 1.81½c. rates, full extras. Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—The tone of the Merchant Steel market is much firmer than is usual at this time of year because of the unusually large tonnages already booked by the mills and in consequence of a continuation of inquiry in a period which is ordinarily inactive. Current prices are unchanged, as follows, officially at least: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—July is an open month as far as Pipe prices are concerned, and the official Pittsburgh card has little or no bearing on actual prices quoted. An effort has been made by large interests to secure long time contracts for large tonnages from jobbers at a marked concession below card prices, but independent mills were not slow to meet the low figures quoted. The card prices, which, as above explained, are only nominal, have not yet been changed and are still on the basis of 73.35, Chicago, to consumers for base sizes, ¾ to 6 inches, on Black Steel; 63.35 on Galvanized steel, 71.85 on Black Iron, 61.85 on Galvanized Iron, with the customary differentials for larger and smaller diameters and X and XX strong.

Boiler Tubes.—The following prices are named to consumers, f.o.b. Chicago, in car lots: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.85. Store prices are, nominally at least, unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1½ to 2¼ inches.....	50	35	35
2½ inches.....	52½	35	30
2½ to 5 inches.....	90	47½	42½
6 inches and larger.....	50	35	..

Cast Iron Pipe.—No orders of any consequence have been booked by the leading producer and inquiry is seasonably light. Prices are unchanged, however, on small lots, as follows: Water Pipe, 4-inch, \$29; 6, 8 and 10 inch, \$28; 12-inch and larger, \$27.50, per net ton, with \$1 extra charged for Gas Pipe. Large tonnages bought by municipalities on a competitive basis, of course, secured considerably lower prices.

Metals.—Business is improving a little, but with the exception of Tin prices are unchanged. Pig Tin, probably because of the settlement of the Amalgamated scale and the resumption of operations by Tin Plate mills, is much stronger. In car lots 31¼c. to 31½c. is quoted and in small lots 32¼c. to 32½c. Spelter, 5¼c. for car lots and 5½c. to 5¾c. for small lots. Casting Copper is 14¾c. to 15c.; Lake, 15c. to 15½c. in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.55c., in car lots at 4.60c., and 5c. to 5.25c. in small lots. The new Sheet Zinc schedule is based on \$7, La Salle, for car lots of 600-lb. casks; car lots, Chicago, are sold on the basis of \$6.75, with small lots selling at from \$7 to \$7.50 per 100 lbs. Prices of Old Copper and Brass are as follows: Copper Wire, 13¼c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 11½c.; Red Brass Borings, 9¾c.; Yellow Brass, Heavy, 8¼c.; Yellow Brass Borings, 7¾c.; Light Brass, 7c.; Lead Pipe, 4¼c.; Tea Lead, 3.85c.; Zinc, 4c.; Pewter, No. 1, 19¼c.; Block Tin Pipe, 25c.

Coke.—Chicago has been the lowest priced market in Coke for many months, but with the disappearance of demurrage Coke and a very marked increase in consumption locally prices have strengthened. Connellsville Coke is quoted at from \$5.15 to \$5.40 for long term contracts and at from \$4.90 to \$5.15 for nearby delivery. Cokes from less favored regions sell at from \$4.65 to \$4.90, with Wise County Cokes stronger at \$4.50, Chicago.

Cleveland.

CLEVELAND, OHIO, July 11, 1905.

Iron Ore.—The movement of Ore down the lakes continues at the record-breaking pace set in June. The total for that month was 4,999,450 tons, by far the largest month's record ever made. No Ore was moved last year until June, owing to the strike of the captains and mates. The total shipments to July 1, this year, were 10,432,701 tons, against 1,708,577 tons to July 1, 1904, an increase of 8,724,124 tons. A total of over 30,000,000 tons is pointed to for the season; but much depends on whether the Steel Corporation moves 19,000,000 tons, as it planned to do earlier in the season. If 32,000,000 tons come down there must be more Ore sold. The market holds firm at \$3.75 for Bessemer Old Range, \$3.25 for non-Bessemer Old Range, and \$3.50 and \$3, respectively, for Mesaba Ores.

Pig Iron.—Pronounced weakness in the Foundry Pig Iron market is evident. On any good order coming up at present the price would probably be cut to \$14 for No. 2 in the Valleys. Some furnaces are holding for \$14.50 on all Iron that is sold, which is in small amounts. No big tonnage has come in for second-half delivery so far, although inquiry has been better in the past week. The buyers have been waiting one upon the other, looking for a lower price. Basic and Malleable Irons are fairly firm, but in Bessemer nothing has been done. The buying of Basic has been especially good, and there are some good inquiries in sight, with the producers talking about a little better prices. The tone of the general Pig Iron market has not improved sufficiently in this territory to warrant much of a change. The producers are more concerned about the use of the new and higher priced Ores in making their estimates of prices than they are about the state of demand on the part of the consumers. The market may be quoted at \$14.50 to \$15, Cleveland, for Bessemer, Basic or Malleable. The Coke market is rather dull and inclined to be weak. Quotations are \$2.50 for 72-hour Foundry Coke at the ovens and \$2 for Furnace Coke at the oven.

Finished Iron and Steel.—The smaller producers have been urging of late that the larger producers of Steel, especially of Structural Shapes, should join in a movement to advance prices about \$2 a ton. The association leaders, however, are disposed to take exception to the proposition. The Structural situation is peculiarly strong. One small consumer in this territory bought a good block of material during the week and paid \$6 a ton premium. Other consumers are paying regularly \$2 and \$3 a ton premium over the market price. There is little possibility of getting any material before the year is out, and some big orders which are coming up in Cleveland may have to wait. It is a question whether the apparent needs of the lake shipbuilders can be met before January 1, especially on new ships which are being figured on and the orders for which will be placed before very long. The association price continues at 1.60c., Pittsburgh. The jobbers are reporting that their deliveries are delayed and that the demand out of stock has been such that it is extremely difficult for them to keep the supply on hand that is needed. The buyers of Steel Bars, especially the manufacturers of agricultural implements, are beginning to feel the market for their year's supply. They would readily contract at 1.40c., Pittsburgh, but manufacturers show no signs of yielding from 1.50c. Buyers seem satisfied with the status of crops and are willing to cover their needs. It will probably not be more than a week or ten days until there is a good buying movement throughout Ohio from this source. A little stronger feeling is noted as to Bar Iron. The fact that its price is below that of Steel is attracting more attention, and at the same time a better demand is evidenced by the fact that mills which were to be idle several weeks are beginning to resume. The price holds at 1.50c., at mill. Sheets are steady, but the market is not markedly strong. Less tendency is shown on the part of the small producer to cut prices, but such things are not altogether unknown. The business done is mostly out of stock at the following prices: No. 10, Blue Annealed, 2.15c.; No. 28 One Pass Cold Rolled, 2.65c.; No. 28 Galvanized, 3.65c. The Billet trade is strong, with Forging Billets in best demand and prices at a premium.

Old Material.—The market has been rather weak, and dealers are collecting a good deal of material. Their yards are filling and there is little demand. However, with the approach of the time when buying may be expected, the dealers are getting stiffer as to their prices. We continue to quote, mostly nominal, all gross tons: Old Steel Rails, \$13.50 to \$14; Old Iron Rails, \$20 to \$21; Old Car Wheels,

\$15 to \$15.50; Heavy Melting Steel, \$13.50. All net tons: Cast Borings, \$7 to \$7.50; No. 1 Railroad Wrought, \$14 to \$14.50; No. 1 Busheling, \$12; Iron Axles, \$21 to \$22; No. 1 Cast, \$12.50 to \$13; Stove Plate, \$8.50 to \$9; Iron and Steel Turnings and Drillings, \$9.

Pittsburgh.

PARK BUILDING, July 12, 1905.—(By Telegraph.)

Pig Iron.—While the general Pig Iron market is quiet, there is more inquiry for small lots ranging from 250 tons up to 1000 tons or more. Although sales are small they are more frequent, and it is believed that before this month is out Pig Iron will be moving more freely, as prices have got down to a point where buyers are taking more interest in the market. Bessemer and Basic Iron are held at about \$14, Valley furnace, or \$14.85, Pittsburgh. We note sales of about 5000 tons of Bessemer, made up of several lots, at prices ranging from \$14 to \$14.35, Valley furnace; also a sale of 1000 tons of Basic Iron at \$13.80, Valley. We note more inquiry for Foundry Iron, but sales so far have been in small lots and for prompt delivery. Many consumers of Foundry are about out of Iron but are not willing to buy ahead, confining their purchases to actual requirements. Northern No. 2 Foundry is held at \$14.25 to \$14.50, Valley, but in a few cases where fairly large tonnage was involved, and on condition that the buyer would take out some of the Iron in July, about \$14, Valley furnace, has been done. There is very little inquiry for Forge Iron, Northern brands being held nominally at \$13.75, Valley, or \$14.00, Pittsburgh.

Steel.—There is more inquiry for Steel, particularly for Sheet and Tin Bars, due to the starting up of a number of the independent Sheet and Tin Plate mills that have signed the wage scale. One Open Hearth Steel plant has made quite a number of sales of Billets and has its surplus product sold up for the next three months. We quote Bessemer and Open Hearth Billets at \$22 to \$22.50, and Sheet and Tin Bars, random lengths, \$23.50 and cut lengths \$24, maker's mill. There is some inquiry for Axle Billets and we quote these at \$24 to \$26, maker's mill, depending on carbons.

(By Mail.)

While general trade is quiet, there is a better feeling sentimentally, and reports from a number of sources are that inquiries are more plentiful. It is the consensus of opinion that the situation will not show much change during July or August, but a material improvement is expected early in September. New contracts have been light for several months, except on Plates and Structural Steel, and large stocks held by jobbers have been pretty well worked off. This is indicated by the fact that new orders coming in usually call for prompt shipment, showing conclusively that the buyer needs the material. Buying is likely to be of a hand to mouth character until consumers believe the bottom of the market has been reached and that it is safe to contract ahead. At the same time it is true that on such lines of Finished Material controlled by agreement prices are guaranteed against decline and the buyer runs no risk in ordering ahead. The settlement of the Sheet and Tin Plate scales has resulted in the starting up of a number of plants that expected to be idle for a much longer time. This means an increased consumption of Steel and will help that market.

Bessemer and Basic Pig Irons continue quiet in demand and have settled down to \$14, at furnace, although some sellers are inclined to hold Bessemer Iron at \$14.50, Valley furnace. Buying is of a hand to mouth character and reports printed last week that the Cambria Steel Company had bought 10,000 tons are untrue but were probably based on the fact that the concern bought a small tonnage of Bessemer from the Dunbar Furnace Company, which has a comparatively low freight rate from Dunbar to Johnstown. Northern No. 2 Foundry Iron is held nominally at \$14.50, Valley furnace, but in a few special cases, and where a fairly large tonnage was involved, a lower price has been named. There is practically no demand for Forge Iron, which is held at \$13.75, Valley, or \$14.00, Pittsburgh. There is a little better demand for Steel, and some of the independent Sheet and Tin Plate mills which have conversion contracts which will soon expire are negotiating for renewals. One leading Open Hearth plant reports that it has sold considerable Steel in the past month and has all the orders it can take care of in the next three months. Bessemer and Open Hearth Billets remain at \$22 to \$22.50, and Sheet and Tin Bars, \$23.50 to \$24, maker's mill. Tonnage in Finished Iron and Steel is of fair volume and demand for Plates and Structural Steel continues heavy. Sheets and Tin Plate are rather weak in price on account of dull demand. Scrap is showing a little betterment in demand and in prices, but Coke is dull and is selling at low figures for prompt shipment.

Ferromanganese.—There is very little inquiry, and only for small lots. We quote foreign and domestic 80 per cent. Ferro at \$49.50, delivered.

Rods.—The quiet condition of the Wire trade is reflected in Rods, which are dull. We quote Bessemer and Open Hearth Rods at \$32 and Chain Rods at \$33, maker's mill. If any large business was offering it is probable these prices would be shaded to a slight extent.

Steel Rails.—This trade has been very active in the past month, and the mills have booked quite a heavy tonnage. The Ohio works of the Carnegie Steel Company is now on Rails, and the Republic mill at Youngstown will start rolling Rails on July 17, this concern having a considerable tonnage of Rails on its books. We quote Standard Sections at \$28, at mill. There is some inquiry for Light Rails but prices are weak. We quote at \$22.50 to \$25, depending on weight.

Skelp.—The market continues very quiet and will not show an improvement until the Pipe trade gets better. The Moorehead Skelp mill in this city has started up after being idle for more than a month on account of wage troubles. We quote Bessemer Grooved Skelp at 1.50c. to 1.55c. and Open Hearth 1.55c. to 1.60c., with \$1 advance for Sheared. Grooved Iron Skelp is about 1.60c., and Sheared 1.67½c. to 1.70c., maker's mill. On a firm offer the above prices would not doubt be shaded.

Plates.—Demand for Plates continues quite heavy and the Steel car trade, which has been quiet since the Baltimore & Ohio placed its order for 10,000 cars, is showing signs of activity again. Two of the leading Western roads are in the market for 8000 Steel cars, which are expected to be placed before long. These will require close to 100,000 tons of Plates and small Shapes. Prices are firm, but without change, and we quote: Tank Plates, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges.....	\$0.10
Gauges No. 7 and No. 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
Marine, "A. B. M. A." and ordinary Fire Box Steel Plates.....	.20
Still Bottom Steel.....	.30
Locomotive Fire Box Steel.....	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—While no large contracts have recently been placed in this district, there is a very heavy business being placed in other sections, and all the leading Structural concerns are filled up for the next two or three months and are having trouble in getting deliveries from the Steel mills, which are from two to four months behind on orders, especially on the small sizes of Beams and Channels. Reports are that H. C. Frick is to erect a very large structure on the Cathedral site in this city which will take upward of 15,000 tons of Steel, but the report is not verified. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth. subject to half extras on the Standard Steel Bar card.

Sheets.—Shortly after this report was written last week the Sheet scale was settled with the American Sheet & Tin Plate Company, and the independent mills and a number of plants that closed on June 30 have started up again. Demand for Sheets continues dull, but is expected to show improvement before long. It has been pointed out by an authority that prices of Sheets at the present time, from the standpoint of Steel, are lower than they were at this time last year. In July, 1904, Sheet Bars were selling at considerably less than they are to-day, while the present price of Sheets is only about \$2 a ton higher than a year ago. It is not believed that prices of Sheets can go much lower than they are now unless Steel should go off considerably, which is hardly likely. We quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.05c. to 2.10c.; No. 26, 2.15c. to 2.20c.; No. 27, 2.15c. to 2.20c.; No. 28, 2.25c. to 2.30c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.75c. to 2.85c.; Nos. 25 and 26, 2.95c. to 3.05c.; No. 27, 3.13c. to 3.23c.; No. 28, 3.35c. to 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.65 to \$1.75 per square, and Galvanized Roofing Sheets.

No. 28 gauge, at \$2.85 to \$2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—Tonnage in both Iron and Steel Bars continues fairly active and prices are a little firmer on Iron Bars, due to the improvement in prices and Scrap. The Steel Bar mills reiterate the opinion that prices will not be reduced and that consumers will not run any risk in making contracts ahead. A good deal of tonnage is in sight, but is being held back, and some consumers who will have to come into the market before long will probably buy from hand to mouth until they are satisfied that prices will not go any lower. We quote Common Iron Bars at 1.55c. to 1.60c., Pittsburgh; Steel Bars are 1.50c., base, for carloads and larger lots, but this price is shaded by some of the jobbers, who have large stocks of Bars, bought when prices were 1.30c. to 1.40c., at mill.

Hoops and Bands.—Specifications on old contracts for Hoops and Bands are coming in freely and some new tonnage is also being placed. Prices on both Hoops and Bands are being maintained absolutely and efforts of buyers to shade them have been fruitless. We quote Steel Hoops at 1.65c. and Bands at 1.50c., usual extras on the latter.

Tin Plate.—As a result of the settlement of the Tin Plate scale last week a number of mills that closed on June 30 have resumed and others are getting ready to start. Demand for Tin Plate continues quiet but will probably soon show improvement as the canning season will soon open. Reports that the Standard Oil Company had placed an order with the American Sheet & Tin Plate Company for 2,000,000 boxes of Tin Plate are absurd and without truth. We quote Tin Plate at \$3.50 to \$3.55, base, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days. Some of the jobbers with large stocks of Plate on hand continue to shade this price about 10c. a box.

Merchant Steel.—A fair amount of new tonnage is being placed, but the large season contracts are being held back, consumers waiting to see if prices will not be lower. Prices are fairly firm and we quote: Flat Sleigh Shoe, 1.50c. to 1.55c.; Toe Calk Steel, 2c. to 2.05c.; Smooth Finished Tire, 1.65c. to 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Railway Spring Steel, 1.65c. to 1.70c.; Crucible Tool Steel, 5½c. to 8c. for ordinary grades; special grades, 12c. and upward. Shafting is in fair demand, discounts being 50 per cent. off in carloads and 45 per cent. in less than carloads. For delivery at certain competitive points these discounts are slightly shaded by one or two concerns.

Spelter.—Demand continues quiet, but prices are unchanged. We quote prime grades of Western Spelter at 5.10c., St. Louis, or 5.22½c., Pittsburgh.

Merchant Pipe.—We are advised that demand for Merchant sizes of Pipe so far in July has shown a little improvement over the latter part of June. There is no demand for oil country goods, but a good deal of tonnage in large sizes of Pipe is going into the oil and gas fields in Texas. A prospective order is one of 600 miles for an oil line running from the Kansas oil fields to Port Arthur, Texas. Prices on Pipe are fairly well maintained—that is, on the basis of two points, or \$4 a ton below the discounts of the leading interest. These discounts to jobbers, which are shaded to the above extent, are as follows:

Merchant Pipe.					
	Steel.		Iron.		
	Black.	Galv.	Black.	Galv.	
	Per cent.	Per cent.	Per cent.	Per cent.	
¾ and 1 inch.....	67	51	65	49	
1 and 1½ inch.....	71	59	69	57	
2 to 6 inches.....	75	65	73½	63½	
7 to 12 inches.....	79	55	68½	53	
Extra strong, plain ends, ¾ to 1 inch.....	60	48	58	46	
1½ to 4 inches.....	67	55	65	53	
4½ to 8 inches.....	63	51	61	49	
Double extra strong, plain ends, ¾ to 8 in.....	56	45	54	43	

Boiler Tubes.—Demand continues very active, and the mills are from four to six weeks behind in deliveries. Reports of cutting in prices of Boiler Tubes are officially denied, as the active demand and the fact that the mills have more orders than they can fill makes any cutting in prices unnecessary. Discounts are as follows:

Boiler Tubes.			
	Iron.	Steel.	
1 to 1¼ inches.....	41	44	
1¼ to 2¼ inches.....	41	56	
2¼ inches.....	46	58	
2½ to 5 inches.....	53	64	
6 to 13 inches.....	41	56	

Coke.—Demand for Coke continues dull, but some great records for output were made in the first half of this year, when nearly 9,000,000 tons of Coke were made in the Upper and Lower Connellsville region. The Coke output for all of this year is expected to exceed 15,000,000 tons, which will beat the record of any previous year by more than 2,000,000 tons. Out of a total of 30,540 ovens in the Upper and Lower Connellsville region more than 4000 ovens are now idle, and this number will be materially increased, as the large Coke makers are steadily blowing out ovens and some of the small plants have closed, while others are getting ready to do so.

Strictly Connellsville Furnace Coke for July, August and September delivery is held at \$1.85, at oven, but for balance of the year \$2 to \$2.10, at oven, is asked. Coke makers believe that prices of Coke in the last three months of the year will be higher than in third quarter. A leading consumer has bought a large tonnage of Furnace Coke for delivery in third quarter at \$1.85, at oven. Strictly Connellsville 72-hour Foundry Coke is held at \$2.35 to \$2.40 a ton at oven. Outside makes of Furnace Coke are being offered as low as \$1.50 a ton, and Foundry at \$2 a ton at oven. Crushed Coke is held at \$1.90 to \$2 a ton at oven.

Iron and Steel Scrap.—A material improvement in demand is noted for Scrap, and prices are also better. Some of the large consumers bought heavily of Scrap when prices were at their lowest, one Open Hearth plant taking upward of 15,000 tons of Heavy Melting Scrap. We quote: Heavy Melting Scrap, \$14; No. 1 Wrought Scrap, \$15.75 to \$16; Cast Iron Borings, \$7.25; Bundled Sheet Scrap, \$12.50; Cast Steel Scrap, \$14; Wrought Iron Turnings, \$12.75; Old Steel Rails, short pieces, \$14; long pieces, \$14.50, all f.o.b. cars, Pittsburgh.

Cincinnati.

FIFTH AND MAIN STS., July 12, 1905.—(By Telegraph.)

Pig Iron.—Another week of summer dullness has been brought to a close, the state of the market being practically unchanged so far as actual business is concerned. There is one feature of the situation that indicates a slight improvement, and that is in the line of inquiries, which have the true ring that will without doubt develop considerable trade in the near future. Notwithstanding the fact that prices have again slowly settled another notch buyers are keeping aloof and are evincing no special interest in the situation further than to supply daily needs. This condition of affairs, we apprehend, will continue until a few of the heavy consumers make a bold move and enter the market for a supply covering the remainder of the year, which will doubtless call forth bottom prices, thereby checking any further downward tendency. That conditions are about ripe for just such a movement is conceded by those well informed and may be looked for almost any time. Prices are very unstable, and while \$10.75, Birmingham, basis for No. 2 is doubtless well established and the ruling quotation we are advised of one sale of 250 tons to an Indiana implement maker that went on a \$10.50 basis. While this has been done and doubtless will be again, it seems unwise in the light of present facts to make this the minimum quotation and we will therefore adhere to the schedule as printed below. We are also told that a Pipe industry purchased in the neighborhood of 5000 tons, part Alabama and the remainder Tennessee Iron in assorted lots, paying therefor a shade less than \$10.50. There is one inquiry from a southern Ohio concern for six months' requirements, representing probably 2000 tons, and one from a local consumer for 300 tons special analysis Iron. Outside of these inquiries there is a fair sprinkling of carload lots for immediate shipment. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$14.00 to \$14.25
Southern Coke, No. 2.....	13.50 to 13.75
Southern Coke, No. 3.....	13.00 to 13.25
Southern Coke, No. 4.....	12.50 to 12.75
Southern Coke, No. 1 Soft.....	14.00 to 14.25
Southern Coke, No. 2 Soft.....	13.50 to 13.75
Southern Coke, Gray Forge.....	12.50 to 12.75
Southern Coke, Mottled.....	12.00 to 12.25
Ohio Silvery, No. 1.....	19.00 to 19.25
Lake Superior Coke, No. 1.....	15.65 to 15.90
Lake Superior Coke, No. 2.....	15.15 to 15.40
Lake Superior Coke, No. 3.....	14.65 to 14.90

Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	\$18.00 to \$18.25
Lake Superior Car Wheel and Malleable.....	17.75 to 18.00

Coke.—The market is reported to be a little stronger, with Furnace grades in better demand. Prices are about the same as last week's quotations. We quote the best grades of Connellsville Foundry from \$2.25 to \$2.60, f.o.b. ovens.

Plates and Bars.—Prices for this class of material are practically unchanged. Mills are said to be away behind in making deliveries, on account of the extraordinary demands made upon them in the way of Universal Plates for building vessels and cars. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in smaller lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—We have no advices of any new developments along this line and trade is said to be exceedingly

quiet. We quote, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$13 to \$14 per net ton; No. 1 Cast Scrap, \$10 to \$10.50 per net ton; Iron Rails, \$16 per gross ton; Steel Rails, rolling mill lengths, \$12 per gross ton; Relaying Rails, 56-lb. and upward, \$21 per gross ton; Iron Axles, \$18 to \$18.50 per net ton; Car Wheels, \$14 to \$15 per gross ton; Heavy Melting Scrap, \$11 per gross ton; Low Phosphorus Scrap, \$14 to \$14.50 per gross ton.

Philadelphia.

REAL ESTATE TRUST CO. BUILDING, July 11, 1905.

The Iron and Steel markets are beginning to show signs of greater activity. Sales have been somewhat more numerous and inquiries are coming in from nearly all classes of buyers. Prices show a little more firmness, although there is a great deal of irregularity, and in some cases extremely low figures have been named, but it is evident that July will develop prices which will bring in a large amount of business. This feeling is somewhat tempered by the possibility of an unfavorable furnace report, in which case buyers will no doubt try for still lower figures. Producers of Pig Iron, however, have about reached their limit, and it will be no easy matter to secure further reductions, as there is a firm determination to curtail production unless something better than first cost can be realized, and it is claimed that present prices are about as far as they can go in that respect. Accumulations of undesirable stock will, however, have to be sold for what they will bring; so that some low prices will no doubt be heard of before the market gets its proper gait. In the more advanced lines reports are very good. The mills are taking in a considerable amount of new business, while specifications on old contracts are coming in very satisfactorily. There also appears to be a better prospect in the Skelp trade, which has been exceptionally dull during the past three or four months. Inquiries for large tonnages of Pig Iron from mills that make a specialty of Muck Bars is regarded as an indication of a recovery in the Pipe trade, which would be very helpful to several collateral interests. On the whole, therefore, the second half of the year begins with prospects of a decided increase of activity, and while it may require time to adjust prices and to get things started a very large business appears to be as near to a certainty as anything can be.

Pig Iron.—There is a better movement in Pig Iron than might have been expected, considering the holidays. No very large tonnages have been taken, but quite a number of sales are reported in lots of 100 to 200 or 300 tons, while there are several inquiries for lots of 1000 to 5000 tons each. Ordinarily \$16.25 is quoted for No. 2 X Foundry and about \$15.75 for No. 2 Plain, but business has been done at better figures than these for favorite brands, and in some cases prices have been lower than those named. All depends upon the circumstances in each particular case, but for a fair average \$16.25 is about right for No. 2 X Foundry. Competition for some particular order may reduce the price a little, or for a quick delivery when the metal is on hand, but there is no disposition to accept business for long date delivery unless at pretty full prices. Makers recognize the fact that while it may be well to meet the market for early shipments it is hardly worth while to sell too far ahead in view of present conditions and the probability of a largely increased business later on. To-day's prices are not regarded as remunerative, and as the statistical position is expected to improve after this month there would in that case be no reason for making further concessions in prices. This feature is distinctly seen in conversation with makers of Pig Iron and is confirmed by quotations given in response to inquiries. Nevertheless it is hardly the time to advance quotations, but it is clearly evident that strong efforts will be made to prevent declines, so that it is a fair presumption that July will show the lowest prices during the last half of the year unless something entirely unforeseen occurs. To-day's range of prices in ordinary cases would be about as follows for Philadelphia and nearby deliveries:

No. 1 X Foundry.....	\$17.25 to \$17.50
No. 2 X Foundry.....	16.00 to 16.50
No. 2 Plain.....	15.50 to 16.00
No. 3 Foundry.....	14.75 to 15.25
Standard Gray Forge.....	14.50 to 14.75
Basic, nominal.....	16.00
Low Phosphorus.....	20.25 to 20.50
Southern No. 2 X Rail.....	15.25 to 15.50
Southern No. 2 X Rail, on dock.....	14.75

Steel.—There is a very good demand for prompt shipments and prices are firm at \$26 for Open Hearth Steel and a little better than that for small lots. Prospects indicate considerable activity during the fall months, so that sellers are disposed to be very conservative in quoting for long date deliveries.

Ferromanganese.—Prices are nominally about \$47, f.o.b. ex-ship, but there is some expectation of an advance owing to the unsettled conditions in the Black Sea districts, which supply most of the Ores.

Muck Bars.—No business can be reported, so that prices are purely nominal at from \$27.50 to \$28.50, according to delivery. Indications favor the probability of a consider-

able demand in the near future, however, at something near the figures named, but for the present no actual sales can be reported.

Plates.—The demand is quite large, although the individual lots are not important; but consumers of all classes seem to be taking something, so that the mills are kept very busy. Some of the largest mills in the district made record outputs during last month and expect to average equally well this month, and thereafter also from present appearances. Prices are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide.....	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under.....	1.63½	1.68½
Flange or Boiler Steel.....	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel.....	1.93½	1.98½
Still Bottom Steel.....	2.03½	2.08½
Locomotive Fire Box Steel.....	2.23½	2.28½
The above are base prices for ¼-inch and heavier. The following extras apply:		Per 100 pounds extra.
3-16-inch thick.....	\$0.10	
Nos. 7 and 8, B. W. G.....	.15	"
No. 9, B. W. G.....	.25	"
Plates over 100 to 110 inches.....	.05	"
Plates over 110 to 115 inches.....	.10	"
Plates over 115 to 120 inches.....	.15	"
Plates over 120 to 125 inches.....	.25	"
Plates over 125 to 130 inches.....	.50	"
Plates over 130 inches.....	1.00	"

Structural Material.—All the reports from this end of the business are of the most satisfactory character. Some specialties are so hard to get with reasonable promptness that many of the mills are unable to promise delivery in less than from four to six months, although four to six weeks will bring most of the sizes. Prospects are excellent and prices firm and unchanged—viz.: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—Steel Bars are in good demand, although there is no great rush for either Iron or Steel unless for special work. Most of the mills will not exceed a two-thirds production this month, however, so that supplies ought to be pretty well worked down. Prices are steadily held at 1.63½c. for either Iron or Steel, and it is believed that the demand is on the eve of improvement, although, as we said before, there is no great urgency at the moment.

Sheets.—Business is rather dull just at present, but the mills are carrying very little stock, so that it is a good opportunity to get a little of something ahead. Prices are unchanged as last quoted, viz.: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

Old Material.—There is a better feeling, although as yet it has not resulted in much better prices. Holders are a little firmer, however, and as buyers will soon begin to need material it is believed that the next move will be toward higher figures. Bids and offers for lots delivered buyers' yards are about as follows:

Scrap Rails.....	\$15.00 to \$15.25
No. 1 Steel Scrap.....	14.50 to 15.00
Old Steel Axles.....	16.00 to 17.00
Old Iron Axles.....	21.00 to 22.00
Old Iron Rails.....	18.00 to 19.00
Old Car Wheels.....	14.00 to 14.50
Choice Scrap, R. R. No. 1 Wrought.....	15.50 to 16.00
No. 1 Yard Scrap.....	14.00 to 15.00
Long and Short.....	13.00 to 14.00
Machinery Scrap.....	14.00 to 14.50
Wrought Iron Pipe.....	11.50 to 12.00
No. 1 Forge Fire Scrap.....	12.00 to 12.50
No. 2 Light, Ordinary.....	10.00 to 11.00
Wrought Turnings.....	10.00 to 11.00
Axle Turnings, Choice Heavy.....	12.50 to 13.00
Cast Borings.....	7.50 to 8.00
Stove Plates.....	9.00 to 10.00

Frank Samuel has bought the entire personal property of the Trigg Shipbuilding Company, Richmond, Va. This has been regarded as a very complete and modern shipbuilding plant, all the tools and equipment being of the most recent date and construction.

George J. Newton has bought the old Easton Sheet mill, formerly run by Oliver & Reilly, and expects to commence to dismantle it this month. The equipment will be sold as machinery and the portions that are unfit for further use will be turned into Scrap.

J. H. McClure & Son have bought a furnace at Allentown, which they will dismantle as soon as possible and offer the Machinery and Scrap for sale.

The New York Subway was opened from the Bronx to the Battery on July 10. Connection with West Farms in the Bronx is by way of the Harlem River tunnel. With the extension of the Subway to the Battery two new downtown stations were opened—South Ferry and Bowling Green, the latter midway between South Ferry and Wall street.

Birmingham.

BIRMINGHAM, ALA., July 10, 1905.

The market is such that one in pursuit of quotations is reminded of the traditional flea of the Irishman—he could always catch it, but it wouldn't stay caught. It's so with quotations. You can get them, but they won't hold good for any length of time. The changes have been frequent and they indicate a slide of 50c. to \$1 per ton during the week. The lowest sale quoted for the week was \$11. The highest was \$12. It is hardly necessary to say that the sales at the maximum were very few. None is reported at \$11.75. There was a high jump of 50c. downward from \$12 to \$11.50, and from this point there was another letting down to \$11.25, and mighty good evidence was to the effect that some sales were made on the basis of \$11 for No. 2 Foundry. But no one will father the sales and the order books are not open for inspection.

Now as to giving correct quotations, opinions differ so much that one is lost as to what is a correct quotation. One party says the market should be quoted on an \$11 basis for No. 2 Foundry, because it sold at that price. Another says, "You can't quote the market below \$11.50 when the bulk of my sales were made at that, with some even higher." One party reports he sold No. 3 Foundry at \$10.50 and another says he actually sold No. 4 Foundry at \$11. One interest reports sale of No. 2 Soft at \$11.50, the amount being 150 tons. Gray Forge is quoted all the way from \$10 to \$10.50, yet the writer has heard of the sale of a good lot at \$9.75.

One interest sold during the week 1500 tons on the basis of \$11.50 for No. 2 Foundry. In our last letter the fact was mentioned that a large interest was feeling the market for 10,000 tons. The trade was concluded during the week, but it is guesswork as to the seller. It cannot be fastened upon him yet with absolute certainty, but there is no doubt as to the sale. The price is doubly guarded and all the diplomatic efforts to obtain it have borne no fruit.

A majority of the furnace interests report a very good inquiry, and some of it from buyers of round lots, but outside the 10,000-ton lot mentioned above there were no large transactions. They were confined in the main to medium and small sized lots. Buyers are yet asking the anticipation of deliveries not yet matured, and the representative of one interest, speaking of this feature of the market, said he had kept tally on these requests this week to his company and they were just 14. Others continue to report the same feature of the market.

Both the inquiry and the demand were better than they were the week previous. At the close of the week there came in some inquiries from large buyers, which at last information had resulted in no business. We are now mighty close to the point where there isn't much profit in selling, and the more optimistic of the trade see the silver lining of the cloud that has depressed prices and augur therefrom a speedy improvement in existing conditions.

The Pipe works are running along very regularly, but have only moderate offerings of new business. There are rumors afloat concerning the establishment of another Cast Iron Pipe works in this district and they come from sources that command confidence. The promoters and builders will be composed of local and outside parties. The capacity and location have not yet been decided. In fact, the announcement was a little premature, as the plans are not definitely decided upon.

There is another large and important enterprise that will soon be announced involving the erection of furnaces and a Steel plant. Announcement is delayed pending the maturing of the plans for the launching of the enterprise.

Scrap Iron is only moderately active, with some sales to both Eastern and Western points. Quotations are as follows:

Stove Plate.....	\$9.00
Heavy Cast.....	10.75
Old Steel Rails.....	13.00
Old Iron Rails.....	18.00
Open Hearth Steel Scrap.....	\$12.00 to 13.00
Iron Car Axles.....	16.00
Steel Car Axles.....	13.50 to 14.00
Old Car Wheels.....	14.00 to 15.00
Relaying Light Rails.....	22.00 to 24.00
Relaying Heavy Rails.....	24.00 to 25.00
Railroad Wrought.....	16.00

Coal and Coke are about the same in price as was quoted in last letter, say from \$3.75 to \$4 for Coke, according to reputation and environments. Some of the interests that have been supplying the demand here have cut down their offerings materially and some have temporarily withdrawn owing to absorption of their output. Sales for a while must necessarily be restricted. Foundry Coke is still \$4.

Some new industries have been investigating the inducements offered for the establishment of plants in the district, with prospects favorable to their removal here. The Commercial Club has been doing some missionary work in this line, with good prospects for inducing the location in the district of a flint glass bottle factory, a stove foundry, a patent fire proof door and window factory and also the location of a large plant for the manufacture of Portland cement. The cement plant, if the efforts to establish

it are successful, will involve the expenditure of at least \$400,000. Among the projectors of the scheme is J. R. Hannahan, president of the Carolina Portland Cement Company. They ask the local community to take \$120,000 of the stock. We have the raw material close at hand and in inexhaustible amount, and we have the location that will always command favorable freight rates. This district can make it and put it on the cars and deliver it for less than any other section within reach of possibilities. Besides the home demand we would have that of the Panama Canal and the countries beyond. The scheme looks well on paper and the probability is the industry will be located here.

A new Richmond, in the firm of Foust & Gilbert, has entered the field of endeavor here to engage in the business of handling Pig Iron, Steel, Coal and Coke, Car Wheels and Logging Cars, besides the equipment in demand from mills, contractors' supplies, Locomotives, Relaying Rails, Scrap material, &c. The senior of the firm has been connected with Rogers, Brown & Co. and the Decatur Car Wheel Works, and the junior member comes from New Orleans, where he was a member of the firm of Frank Davies, engaged in a similar business. The firm is located in rooms 427 and 429 Woodward Building.

There is no let up in the march of progress in the district. Architects, builders, contractors, all have their hands full of business, and the horoscope of the future tells a flattering tale.

Labor Notes.

On Monday the foundry helpers and laborers on strike from the foundry of John J. Riley, South Brooklyn, N. Y., applied for work in a body. Mr. Riley would not treat with them in any way except as each individual might apply to him. Subsequently, upon the personal application of ten strikers, he took them back into his employment under the same conditions of wages and hours that prevailed when they struck. He has refused to re-employ nine of the strikers and has retained a large number of the workmen employed during the strike. He has now in name and in fact an open shop so far as his foundry helpers and laborers are concerned. This leaves the strike confined to the E. W. Bliss Company, which is maintaining the position it has taken from the commencement of the strike.

The holders-on, who, with the other trades in the boiler shop of the John N. Robbins Company, Erie Basin, Brooklyn, N. Y., have been on strike for about one week, returned to work on Monday. The strike was called to enforce an increase of 15 cents a day in wages to the holders-on. No concessions were made by the company.

Reports received from 15 firms employing 100 pattern makers in Philadelphia, Pa., show the average rate of wages paid to be 30 71-100 cents per hour. Of the above number of pattern makers 49 per cent. are working 54 to 55 hours per week, 15 per cent. from 56 to 57 1/4 hours per week and 36 per cent. 60 hours per week.

At a dinner held by the Cincinnati Metal Trades Association June 29 the proposition of the local association to merge into the National Metal Trades Association was passed unanimously. Now the Cincinnati Metal Trades Association will be a local branch of the national.

A number of the Eastern bar iron manufacturers have agreed to meet in conference officials of the Amalgamated Association to arrange a wage scale. The Amalgamated Association has a fairly large following among the Eastern mills, and the object of the conference is to have a uniform wage scale for such mills as run union. The conference will be held this week and the scale presented to the Eastern manufacturers was printed in *The Iron Age* of May 25.

The American Sheet & Tin Plate Company will hereafter operate its Pittsburgh and Pennsylvania tin plate plants at New Kensington, Pa., on a nonunion basis.

The striking teamsters in Chicago are steadily losing ground, a recent blow to their cause being an order issued by the court compelling express companies and parcel delivery companies to deliver to boycotted firms. Such deliveries hereafter will be made through a firm known as the Chicago Cartage Company, which was organized by the express and parcel companies for that purpose.

New York.

NEW YORK, July 12, 1905.

Pig Iron.—The larger contracts pending in this market for some time past have not yet been definitely closed. The market continues dull and a shade weaker, with New England the battle ground of the Buffalo, the Eastern and the Southern furnaces. We quote for Northern Irons, at tidewater, \$16.25 to \$16.50 for No. 1 Foundry, \$15.50 to \$16 for No. 2 Foundry, \$15 to \$15.25 for No. 2 Plain and \$14.50 to \$15 for Gray Forge. Southern Iron is selling on the basis of \$14.75 to \$15 for No. 2 Foundry.

Steel Rails.—Among the orders taken recently by one of the Eastern mills is a lot of 15,000 tons for the Northwest. The Republic mill will probably run on Rails every other week. The company has orders on hand for 20,000 tons, but was unable to meet deliveries on a like aggregate.

Cast Iron Pipe.—Manufacturers report a very much better volume of business, the demand for small lots having improved decidedly. This city will open bids July 19 for upward of 3000 tons. Prices are easy, in sympathy with the lower values prevailing in Pig Iron. Carload lots are quoted at \$27 per net ton for 6-inch at tidewater.

Finished Iron and Steel.—The Structural trade continues exceedingly active. The conditions in this branch of business are very much better than in any other department of the Iron trade. The American Bridge Company secured an aggregate of 25,000 tons of bridge and building work during the past week, the largest contract being that for the new building of the United States Express Company in this city, which will require some 6500 tons of steel. Included in the new business entered were quite a number of railroad contracts of 1000 to 1200 tons each. The activity in the Structural line bids fair to continue, and the belief is entertained that the mills will be wholly unable to supply the demand for Shapes. In fact, the statement is made that some good sized orders have already been sent abroad for Structural Material which cannot be furnished by the domestic mills in time to meet the requirements of builders. Heavy premiums are being paid to local yards for immediate delivery of Shapes. In some instances 2.75c. has been secured for such deliveries. The Plate trade is quiet in this immediate vicinity, but the Eastern mills are reported well supplied with work, particularly on the lighter gauges. Some indication of awakening interest in Bars is shown by the entrance into the market of a large Eastern consumer, who placed contracts for Steel Bars approximating 4000 tons, which were divided between two Pittsburgh manufacturers and on which the full official price was paid. An interesting transaction is a contract taken by a Pittsburgh company for 2000 tons of Twisted Bars for reinforcing concrete. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04½c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.59½c. to 1.64½c.; Soft Steel Bars, 1.64½c.

Old Material.—Plenty of inquiries are reported for everything on the list. Buyers, however, are not disposed to close except when they are absolutely certain that bargains are being secured. Some of the offers now being made by consumers are considered absolutely out of the question by dealers or other holders of Old Material. While members of the trade are now inclined to postpone to a little later date the revival in the demand, few of them look further than September 1 for the general appearance of buyers in the market. Prices per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails.....	\$16.00 to \$17.00
Old Steel Rails, rerolling lengths.....	13.25 to 14.25
Old Steel Rails, short pieces.....	13.00 to 14.00
Relaying Rails.....	19.50 to 20.50
Old Car Wheels.....	15.00 to 16.00
Old Iron Car Axles.....	18.00 to 19.00
Old Steel Car Axles.....	16.00 to 17.00
Heavy Melting Steel Scrap.....	13.00 to 14.00
No. 1 Railroad Wrought Scrap.....	14.50 to 15.50
No. 1 Yard Wrought Scrap.....	13.00 to 14.00
Iron Trunk Scrap.....	12.50 to 13.50
Wrought Pipe.....	11.00 to 12.00
Ordinary Light Iron.....	7.50 to 8.50
Cast Borings.....	6.50 to 7.50
Wrought Turnings.....	10.00 to 11.00
No. 1 Machinery Cast.....	13.50 to 14.50
Stove Plate.....	11.00 to 12.00

Incorrect Tin Plate Report.—A Pittsburgh paper printed a report this week that the Standard Oil Company had placed a contract with the American Sheet & Tin Plate Company for 2,000,000 boxes of tin plate, to be used in its export trade, on the basis of about \$2.50 a box at mill. The report is vigorously denied by officials of the American Sheet & Tin Plate Company.

Metal Market.

NEW YORK July 12, 1905.

Pig Tin.—The advance of last week on the strength of the statistical position has been continued throughout the week on a fair amount of business. On Friday a very good business was done, and on Saturday a fair number of sales were made late in the day. The business of these two days resulted in a sharp advance in London on Monday, which was responsible for another advance in New York. The market is exceedingly strong as to the figures, and some indications point to a belief in continued strength for some time, especially the slow creeping up of future quotations in London. The stocks held in Holland, London and New York are below the average amount of metal usually held in these centers. At the market price, or at import cost, there is a sharp competition for business, and holders of metal are very willing to sell at about these figures. The market to-day closed strong at 31.25c. to 31.50c. for spot, 31.12½c. to 31.45c. for July and 31c. to 31.40c. for August. The London market was also firm, and to-day's quotations close at an advance from yesterday at £143 for spot and £141 10s. for futures. The arrivals so far this month have been fair, amounting to 1435 tons, and there are afloat for American ports 2488 tons.

Copper.—A rumor was prevalent during the week that the Chinese consumers had again entered the market for a considerable tonnage, but none of the dealers most likely to secure this business have admitted the sale. The market continues strong, however, on account of the statistical position which may be characterized as excellent. The quotations of the New York Metal Exchange are unchanged at 15c. for Lake and Electrolytic and 14.75c. for Casting grades, yet spot stocks are very hard to obtain and some good sized sales have been made at an advance of ¼c. above this quotation. There has been a fair amount sold for delivery in July and August, but buyers are not disposed to load up with any large stocks at these high figures. It is undoubtedly true that buying of this character is responsible for the strong position of the market. The exports so far this month amount to 6098 tons, of which 500 tons go to consumers in the East. In London the market is characterized as firm and quotations there show an advance from last week at £66 5s. for spot and £66 10s. for futures.

Pig Lead.—The market is strong and although there has been an advance in St. Louis to 4.50c. to 4.57½c., the New York quotation remains unchanged at 4.55c. to 4.60c. The American Smelting & Refining Company continues to quote shipment Lead in 50-ton lots at 4.50c. In London the market has had another advance of 3s. and the quotation for Soft Spanish Lead is £13 11s. 3d. In London the price has advanced slightly to £24 2s. 6d.

Spelter.—In St. Louis the market is characterized as strong at 5.17½c., but in the local market quotations have not advanced correspondingly, as they are 5.35c. to 5.40c. for spot and 5.30c. to 5.40c. for July and August delivery. Keen buyers have been able to satisfy their wants at slightly lower quotations. The Ore market in the Joplin district is practically unchanged.

Antimony.—While the quotation for Cookson's and Hall's remains at 13c. to 14c. and other grades at 12c. to 13c., the market has grown very quiet and prices are nominal.

Quicksilver.—The recent advance was responsible for dull business, yet the metal is now held very firmly at \$40.50 per flask of 75 lbs. in 100-flask lots. In London Rothschild's price is unchanged at £7 7s. 6d., and second hands make the same quotation.

Nickel.—The market continues unchanged at 40c. to 45c. per lb. Business is of fair proportions, and stocks on hand are ample to meet the requirements.

Tin Plates.—The settlement of the wage scale last week disposed of the possibility of any scarcity in the supply. It is considered unlikely, however, that quotations will change materially. The quotation is maintained at \$3.74 per box of 100 lbs. IC Coke Plates, f.o.b. New York, or \$3.55, f.o.b. Pittsburgh. In Swansea Plates are held at 11 shillings 6 pence in spite of the fact that there are large stocks on hand in that market.

Through the courtesy of L. Vogelstein & Co., American representatives of Aron Hirsch & Sohn, Halberstadt, Germany, we give the following figures for the German consumption of foreign Copper for the months of January to May, 1905, compared with the same period for 1904 and 1903:

	1905.—Tons.	1904.—Tons.	1903.—Tons.
Imports	42,744	47,231	36,223
Exports	5,324	3,239	4,739
Consumption.....	37,420	43,992	31,484

Of the above 35,882 tons were imported from the United States.

PERSONAL.

W. P. Snyder, president of the Shenango Furnace Company, Pittsburgh, and some of the other officials have gone to the Lake Superior ore regions to inspect mining properties owned by the company.

Oden H. Wharton has been appointed general sales agent of the Crucible Steel Company of America, Pittsburgh, to succeed C. E. Clapp, recently resigned. Mr. Wharton has been assistant general sales agent of the company for some time and previously was in the selling department of the Park Steel Company.

George M. Summers, formerly superintendent of the Valley Works of the Republic Iron & Steel Company, Youngstown, Ohio, has been made general superintendent of the Sligo Iron & Steel Company, Connellsville, Pa.

Patrick McManus, superintendent of the foundry of the Sterling Steel Company, Braddock, Pa., has resigned to accept a position as manager of the Sharon Foundry Company, Wheatland, Pa. The plant of the latter company will be enlarged and an open hearth furnace for the manufacture of steel castings will be added.

Thomas A. Lawler, formerly superintendent of transportation at the Carrie blast furnaces of the Carnegie Steel Company, Rankin, Pa., has resigned to accept the position of manager of the transportation department of the new Midland Steel Company.

F. A. Burgess, for the past two years secretary of the Aurora Automatic Machinery Company, Aurora, Ill., retired from the company July 1. He is succeeded by A. B. Holmes, who is secretary of that company as well as of the Independent Pneumatic Tool Company.

Scott Clingan, acting superintendent of the Republic Iron & Steel Company's Valley plant at Youngstown, Ohio, has been made superintendent of the Toledo works of the same company.

R. H. Wolff, former president of R. H. Wolff & Co., Limited, New York, after having represented the Crucible Steel Company of America for four years in Europe as its general agent, has resigned his position and returned to America. He will probably go to Europe shortly for a rest, but expects to return here in the fall. His present address is 445 Broadway, New York.

Wm. H. Mills of Naylor & Co., New York, recently sailed for England.

Gustaf Gröndal, whose various inventions for the concentrating and briquetting of iron ores have been in use in Sweden and are being introduced in the United States and Great Britain, arrives in New York this week on the Deutschland and expects to return by the same steamer next week. He will visit the newly erected plant of the Pennsylvania Steel Company at Lebanon, Pa., which employs his process.

N. B. Porter, lately associated with the South Baltimore Steel Car & Foundry Company and the Ryan-McDonald Mfg. Company, has accepted the position of general sales manager of the Continental Car & Equipment Company, Whitehall Building, New York.

E. Windsor Richards, the well-known English iron-master, was cut about the head and severely bruised in a motoring accident while touring in France. He has recovered sufficiently to return to London. E. P. Martin, who was with him, was not seriously hurt.

B. F. Harper of the bar department of the Cleveland and sales office of the Carnegie Steel Company, has resigned.

Charles M. Pepper of Washington, D. C., one of the special commissioners appointed by the Department of Commerce and Labor to study commercial and industrial conditions in other countries with a view to increasing the export trade of the United States, started this week on a tour of several weeks in Canada. Iron and steel manufacture and consumption in Canada will be one of the important features of Mr. Pepper's investigations.

We are advised that George A. Baird, vice-president and general sales agent of the Republic Iron & Steel Company, has not resigned, as reported. Mr. Baird went to the Pacific Coast on business for the estate of P. L. Kim-

berly, of which he is executor, but it is thought his duties in this connection will be lightened later so that he may continue in office.

H. C. Frick sailed for Europe on Tuesday.

Robert C. Reed has been appointed superintendent of the electrical department of the Duquesne Steel Works of the Carnegie Steel Company, succeeding Eugene Friedlander, resigned. Isaac F. Howells has been appointed assistant superintendent of the bar mills of the Duquesne plant.

Frank Ryman, at one time president and recently general manager of the New Castle Forge & Bolt Company, New Castle, Pa., has resigned.

W. E. Corey, president of the United States Steel Corporation, is expected to arrive on the steamer Deutschland to-day.

Iron and Industrial Stocks.

NEW YORK, July 12, 1905.

The stock market continued to display great strength for most of the past week, but on Monday afternoon indications of a reaction were apparent, and a decline which was quite considerable in regard to some stocks took place on Tuesday. No special influences, so far as could be observed, were operating in connection with any particular stocks, but the movement in general was considered as reflecting the current belief in the substantial basis for good business throughout the country. The favorable crop prospects are undoubtedly largely responsible for this optimistic feeling. The lowest and highest prices on the most active stocks during the week ending Tuesday afternoon were as follows: Can preferred 67½ and 69½; Car & Foundry common 35¼ and 36¾; Locomotive common 47¼ and 50¼; Colorado fuel 46 and 48¾; Pressed Steel common 39¼ and 40½; Railway Spring common 34½ and 36¾; Republic common 19¼ and 21, preferred 79½ and 81¼; Sloss-Sheffield common 81 and 85¼; Tennessee Coal 87 and 92¾; United States Steel common 32½ and 35½, preferred 90¾ and 102¾, new 5 per cent. bonds 94½ and 95½. Last transactions up to 1.30 p.m. to-day were made at the following prices: Can common 11½, preferred 68½; Car & Foundry common 35¾, preferred 95; Locomotive common 48½, preferred 112¼; Steel Foundries common 9¾, preferred 37½; Colorado Fuel 46¾; Pressed Steel common 39½, preferred 94½; Railway Spring common 35¾, preferred 98; Republic common 20¼, preferred 80¼; Sloss-Sheffield common 81½, preferred 105¼; Tennessee Coal 87¾, ex-dividend; United States Steel common 34, preferred 101¾, new 5's 95.

The Pennsylvania Steel Company has filed at Harrisburg, Pa., a mortgage for \$1,500,000 in favor of the Girard Trust Company, Philadelphia, to cover the new coke oven plant and a tract of land adjoining its plant in the lower end of Steelton. The mortgage bears interest at the rate of 4½ per cent., and the money will be used to carry out the construction of the coke oven plant, on which work was directed to be started by the Board of Directors of the company at its meeting in Philadelphia on July 10. The ovens will be of the Semet-Solvay type and the number is not announced. They will be placed not far from the company's new frog switch and signal department buildings, the product being used for the Steelton furnaces.

Directors of the Crucible Steel Company of America met in Pittsburgh and elected C. C. Ramsey a director and fourth vice-president. No statement was made public, but it is announced that conditions are the best in many months. It is believed that by October there will be no need to issue any of the bonds authorized, as earnings are paying debts.

The entire floating debt of the National Fire Proofing Company, Pittsburgh, has been removed and some additional working capital provided by an issue of \$1,000,000 5 per cent. bonds. These bonds are issued by the Federal Clay Company, an underlying interest of the National Company, and are guaranteed by the National Company. The Federal Company had an early issue, but it was paid off. The present issue is the only one the National has in any form. The bonds have been underwritten by Pittsburgh banks. The price realized was par, less commission, said to be 5 per cent. The company had a floating indebtedness of various kinds aggregating approximately \$900,000.

Dividends.—J. G. White & Co., New York, have declared a quarterly dividend of 1½ per cent. on the preferred stock, payable August 1.

Harbison-Walker Refractories Company, Pittsburgh, has declared a quarterly dividend of 1 per cent. on the preferred stock, payable July 20.

The Union Steel Casting Company, Pittsburgh, has declared its usual quarterly dividend of 2 per cent.

The Machinery Trade.

NEW YORK, July 12, 1905.

The week's business among the machinery trade was enlivened by the appearance of three railroad lists, all of which call for fairly large amounts of machinery and especially machine tools. One of the schedules of requirements illustrated a phase of the machinery business which is becoming especially noticeable of late. That is the tendency on the part of corporations to let out blanket contracts for building and equipping machine shops and other structures where machinery is used to one firm. This plan has lately been taken up by some of the railroads, and has been found to be advantageous. Large engineering firms have taken up the idea with vigor, and following the lead of a well-known firm there are now many contracting engineers throughout the country who have call on the services of machinery experts in every known line as well as experts in the construction of buildings. With the unity of interest established by a single company undertaking a large job it has been found that contracts awarded for the construction and equipment of machine shops and the like to single firms have been carried forward with dispatch and at less cost than if several contracts were given. The same large firms that take such contracts also give expert advice as to the cost of erecting plants for certain forms of manufacture with the result that sometimes parties intending to undertake an enterprise are advised that the investment would be a bad one, and this advice is given by the parties consulted at the cost of losing the contract, although consultation fees are invariably charged. The growth of firms that undertake to construct and equip plants has been rapid of late, and as more are entering the fields they are becoming a decided factor in the machinery trade.

Three Railroad Machine Tool Lists.

During the past week machine tool houses were requested by the Brooklyn Rapid Transit Company to put in bids on quite a large number of tools required for equipping its new East New York shops. Following the plans of some of the large railroad corporations the company did not send out a general list, but selected certain houses to whom it sent specifications for the tools, which it was likely to buy from them. Some of the merchants received specifications for only three or four machines, while others received much larger lists. From this it is inferred that the Brooklyn Rapid Transit has decided upon the make of tools it will buy. This seems more than probable from the fact that John G. Walker, who made up the list, visited several of the houses some time ago and inspected the different makes of tools. Because of this discrimination and cutting up of the list it is impossible to gain an accurate idea as to the number and aggregate value of the machines to be purchased. It will be remembered that the company is to spend about \$1,000,000 for improvements at its East New York yards at Fulton street, Jamaica avenue and Broadway, Brooklyn, N. Y., including not only the erection of a large repair shop, power plant and other buildings, but also the installation of a \$20,000 electric interlocking plant, &c. The main repair shop, in which is to be installed the machinery which the trade is now bidding on, will be a two-story structure, 70 x 350 feet. Both stories of this building will be equipped with modern machinery, including many wall cranes and a 50-ton electric traveling crane, while there will also be a large elevator for lowering the cars from the second to the first floor. A power plant of about 250 horse-power capacity will be required to operate the machinery.

The second machine tool list sent to the trade for bids this week was that of the St. Louis & Iron Mountain Railroad, which was issued through the engineering house of Westinghouse, Church, Kerr & Co., New York. The list calls for a fair sized lot of tools which are intended for the Baring Cross, Ark., shops, where extensive improvements are being made. Westinghouse, Church, Kerr & Co., engineers in charge of the improvements, state that all the plans have not as yet been settled and no announcement will be made of the additional improvements until the work is well under way.

The Pennsylvania Railroad Company is covering its current requirements only at this time, which is due to the fact that the tools and machinery are usually assembled in a programme, and the purchasing agent has been busy making inquiries during the past few months for tools and machinery, a list of which has appeared in these columns. For the next few months the requirements will be rather light. A number of projects will doubtless be worked up in the interval, which will likely result in additional inquiries in the early fall. The current list covers one molding machine, belt driven; one slotting machine, 20-inch, motor driven; one metal working lathe, triple geared, 30-inch swing; one tenoning machine, to work tenon up to 6 inches long, belt driven; one wood working machine, dimension planer 24 x 6 inches, belt driven; one freight handling elevator of 4000 pounds capacity; two outside end packed brass fitted pot valve duplex plunger pressure pumps, 7½ x 4½ x 10 inches,

for 125 pounds steam pressure; one car wheel boring machine, 48 inches, motor driven; one pneumatic forging machine; two 7-inch vertical steam separators, high pressure form.

Important Machinery Requirements.

Within a few weeks E. E. Linthicum, Anniston, Ala., and associates will be in the market for a complete equipment for their proposed cast iron, water and gas pipe and fittings plant, including machine tools, wood working machinery, cranes, cupolas, blowers, engines, boilers, dynamo, steel structural work, &c. These gentlemen will build and operate a plant somewhere in the mineral belt of Alabama, the exact location of which they are not yet ready to make public. In addition to the manufacture of pipe and fittings a general foundry and machine business will be conducted. Mr. Linthicum was formerly manager for the United States Cast Iron Pipe & Foundry Company, at Anniston.

About 30 lathes of various sizes, 20 milling machines, an automatic gear cutter, 10 drill presses and 1 large and 1 small punching press are required by the Couple-Gear Freight Wheel Company, Grand Rapids, Mich., for equipping its new plant. A part of this machinery has already been ordered. The company will commence work in the next few days on the construction of the new building, which will be 50 x 200 feet, one story, with a 14-foot gallery, besides the engine room, shop room and forging room. The building will cost about \$15,000 and will be equipped with machinery aggregating \$55,000 in value, exclusive of the power plant, which will be of 75 horse-power capacity. The company will manufacture electric trucks, couple action gear, four-wheel drive and four-wheel steer, a number of orders for which it has in hand and which are being filled by contract in Chicago. These trucks will be ready for delivery about the time the company's own shop is ready for operation. Later on the company will enter the field for delivering wagons of lighter capacity and will then probably build an extension to take care of that part of the business. The main feature of the trucks which the company builds is the driving electric motor, which forms part of the wheel, each wheel containing a machine. It is said that the four-wheel drive effects a large saving in wear on tires and the four-wheel steer adds very materially to handling trucks for heavy work. There is practically no friction in the driving gear, which results in a large reduction of the drainage on the storage battery.

The Ralston Steel Car Company, Rarigville, Ohio, which was recently organized with a capital stock of \$1,000,000, is in the market for quite an amount of new machinery for equipping its plant for the manufacture of freight cars entirely of steel or steel under frames, also repairing of wooden cars and applying steel under frames to them. The company has purchased the plant recently operated by the Rarig Engineering Company, which manufactured engines, disappearing gun carriages, &c., at the works. It is the intention of the new owners to re-equip the plant. As the plant is well equipped the company has on hand a great many machines which it cannot use and which it wishes to dispose of, they being unnecessary for the manufacture of steel cars.

Considerable new machinery will probably be required by the Morgan Machine Company, Rochester, N. Y., which is to build a new plant at University avenue and Culver road for the building of the Morgan lock corner box machines and nailers. The plant, which will be entirely modern in every respect, will consist of a main shop 122 x 287 feet, with additional building 70 x 101 feet for the engine and boiler room, blacksmith shop, &c. In front of the main building will be an office building 48 x 135 feet, two stories high.

It will be some little time before the Hays Mfg. Company, manufacturer of water and gas specialties, Erie, Pa., will be ready to purchase the necessary mechanical equipment for its new buildings. At the present time the company is ready to purchase the engines, boilers and other power appurtenances. The new buildings which the company intends to erect include a machine shop 50 x 160 feet, two stories high, and a foundry 60 x 198 feet.

The Connellsville Machine & Car Company, Connellsville, Pa., has been reorganized, with a capital of \$150,000. The plant of the company was burned some time ago but will be rebuilt and considerable machinery used in the manufacture of mine cars and mining equipment will be purchased.

The American Can Company has filed plans with the Department of Buildings for a six-story brick structure to be erected between Fourteenth and Fifteenth streets, on Eighth avenue, New York. The building will be 75 x 206 feet, and it will cost in the neighborhood of \$200,000. The company is now completing the final plans for the structure, and it is probable that before long the company will be in the market for machinery for the equipment of the building.

Some machinery is required by the Humphrey Mfg. Company, Towanda, Pa., which has lately been incorporated under the laws of West Virginia, with a capital stock of \$25,000, and which will invest about \$40,000 in the establishment of a machine shop and foundry at Elkins, W. Va.

The equipment has been to some extent provided for. T. M. Cuddy is general manager.

The Paul & Kreuger Rock Drill Company, Stapleton S. I., has incorporated for the manufacture of hand rock drills. The company has already arranged for a completely equipped plant, but a little later on will be in the market for some special machinery, lathes, drills, presses, &c. Chas. F. Paul, Jr., of Chas. F. Paul, Jr., & Co., heating engineers, 3 Cross street, Stapleton, is president of the new company.

Orders were recently placed by the Kerr Turbine Company, Wellsville, N. Y., for the machine tool equipment for its new plant, 30 x 100 feet. The Prentiss Tool & Supply Company, New York, received a large portion of the orders.

F. H. Dukessmith, Meadville, Pa., desires to purchase the following machines at second-hand prices, cash f.o.b. Meadville: One 16-inch engine lathe, compound rest, taper attachment; one universal milling machine, equal to Brown & Sharpe's No. 2; one 13 or 14 inch swing turret lathe; one 24-inch single drill press, back gear; one 12-inch sensitive feed drill press; one 4 or 6 spindle gang drill press, large enough for 1-inch holes; one machine for grinding milling cutters, medium size; one combined buffer and emery grinder, medium size; one 5 to 7 horse-power electric motor; shafting, hangers, pulleys, belting, &c.; one double end wood turning lathe about 14-inch swing; one 24-inch band saw; one medium sized Fox trimmer for pattern work.

The Swift Granite Company, Elberton, Ga., is in the market for a 7 x 7 x 7 or 8 x 8 x 8 inch air compressor and a 12 to 14 horse-power double drum hoisting engine. Second-hand machines will be considered if in good condition.

An undertaking which will require considerable machinery is that of the Thompson-Starrett Company to construct a \$1,500,000 store building on Thirty-fourth street, near Fifth avenue, New York, for John Claffin. The structure will be ten stories in height and will be 150 x 197 feet. The building will be equipped with eight elevators and a good sized power plant.

Municipal and Power Work.

The carrying out of the plan of the Public Service Corporation of New Jersey to construct a rapid transit sub-surface electric line from Newark, N. J., to New York will in all probability entail the construction of an addition to the power house now in course of erection on the Hackensack meadows. As has been stated in *The Iron Age*, the plans of the power house were so arranged that the building which was begun last year was only one-quarter the size the plant will be eventually, and it is thought that the section now being constructed will have to be duplicated before the new line is put in operation. The section now nearly constructed is 180 feet square. The turbine room is 50 feet wide and extends the full length of the structure. There are two 50-ton traveling cranes in the plant, besides 10 boilers, each of 660 horse-power; engines of 8000-kw. capacity, pumps, condensers and the like; also coal and ash handling machinery of modern type. More than 12,000 tons of steel were used in the construction of the building, which is of steel-concrete and brick and is as fire proof as it can be made. The section now in course of construction will be completed very shortly and put in operation at once, and it is thought by that time the Public Service Corporation will have arranged for an extension and the work of construction will go right on.

The Chilean Contracting Company has been formed by interests allied to the firm of J. G. White & Co., 49 Exchange place, New York, to undertake the construction of extensive public works contemplated in Chile, and, in fact, to invade that field which has heretofore been left to a large extent to European firms. While no announcement has been made as to just what the plans of the company might be, it is said that one of its undertakings will be the construction of a harbor for the port of Valparaiso. The formation of the company, which was effected in the offices of J. G. White & Co., is of particular interest to American machinery men, as it practically opens a new field for them. It has been the policy of the White firm whenever possible to do its purchasing here. J. G. White was chosen president of the new company, and the directors elected are as follows: E. C. Converse, president Liberty National Bank; C. C. Cuyler of Cuyler, Morgan & Co., G. L. Duval of Beeche, Duval & Co.; Erskine Hewitt of Cooper, Hewitt & Co.; C. Lewis of Wm. Salomon & Co., Truman H. Newberry of Detroit, F. S. Smithers of F. S. Smithers & Co., Frederick Strauss of J. & W. Seligman & Co., Chas. M. Swift of Detroit, Mich., and J. G. White, F. H. Reed and H. U. Wallace of J. G. White & Co. It is said that negotiations have been going on for some time between the men forming the new company and the Chilean authorities, and much will be undertaken by the new concern in the way of Government construction work. At the office of J. G. White & Co. it was said last week that within a month announcement will be made as to the nature of the contemplated undertakings.

The Commissioner of Water Supply, Gas and Electricity will receive bids until July 19 for remodeling and extending the Massapequa, L. I., pumping station, including the pumping plant, pumping well and infiltration gallery system, together with the necessary appurtenances; also for erecting,

and equipping the New Lots pumping station, Brooklyn. Three boilers are required for the New Lots station.

The Ingersoll-Rand Company, New York, which was recently formed by a consolidation of the Ingersoll-Sergeant Drill Company and the Rand Drill Company, has leased half of the fourteenth floor of the Bowling Green Building as its general offices. The company expects to move into the new offices early in August.

The Los Angeles, Cal., office of the Westinghouse Electric & Mfg. Company, which has heretofore been in the Trust Building, has been removed to 527 South Main street.

Chicago Machinery Market.

CHICAGO, ILL., July 11, 1905.

The business craft has entered the calm waters of the annual dull season of July and August, and orders taken by machinery houses are of a routine character, representing immediate needs of scattered interests. It is not expected that the active selling campaign will open before September, by which time summer vacation periods will be over and proprietors and managers of machinery using industries will begin to cast about for such improvements or enlargements as seem to be warranted. General business conditions in the West are in excellent shape and business for the first two weeks of July is, if anything, a little better than is usual in this period. With local exceptions here and there crop prospects are excellent, and the only menace to an unusually active second half is danger to the corn crop from the fact that the growth has been belated by prolonged cold weather. If we are fortunate enough, as we were last fall, to have killing frosts delayed until late in October we are sure to have an extremely active winter. In other words, the undertone of the metal trades and machinery market is strong and the outlook is most favorable.

The injunctions secured by a local boiler firm restraining the city from opening or awarding bids on boilers are being argued in court and an early settlement is looked for. When this does come it will release over 5000 horse-power and permit the city to award contracts to bidders, or in case the complainants are successful will lead to advertising for new bids. This dispute has led to the adoption of water tube boilers in a number of cases where the city had to have boilers and did not dare risk being tied up by legal proceedings. Most of the municipal plants, except those of the Department of Electricity, are operated by internally fired boilers, and until recently the complaining boiler firm was successful in securing contracts for the installation of such boilers; but when formidable competition appeared that firm resorted to the machinery of law to prevent its rivals from securing too strong a foothold. Demand for small machine tools, boiler shop tools and tools and supplies for use in connection with the erection of structural and plate steel is better than is usual at this time of year.

The Illinois Central Railroad, in addition to the large order placed for tools with the Niles-Bement-Pond Company recently, has bought additional lathes from that firm amounting to \$1675, and has also bought lathes from the Jones & Lamson Company aggregating \$4762.20.

C. A. Hamilton, Oaxaca, Mexico, is installing in his San Juan Baptiste mine a large double drum steam hoisting plant of 2000 feet capacity. This is being set up for a new three-compartment shaft, over which is now being constructed a large gallows frame 73 feet high in the clear. The shaft is equipped with Fraser & Chalmers safety cages and landing dogs at all stations, with a special long guide sinking cage. Allis-Chalmers Company has also supplied 16 ore cars made to fit these cages with Anaconda axles and wheels. The Rosario mine, in which Mr. Hamilton is also interested, is being equipped with an extra heavy steam double hoisting engine. A double drum hoisting outfit has just arrived for the Victoria mine. The Baldomero mine has a single drum steam hoisting plant, which will be replaced in the near future by a double drum steam hoisting engine. Mr. Hamilton is developing several other mines, some of which will soon require hoisting and pumping machinery, and is now engaged in constructing a big customs smelting plant at the city of Oaxaca for the Oaxaca Smelting & Refining Company, New York. Within six or eight months it is intended to install in San Juan a small machine shop and a complete machine shop equipment will be required at that time. Mr. Hamilton's address is Apartado 174, Oaxaca, Mexico.

F. J. Hobson is in the United States buying a machinery equipment for the Peregrina Mining & Milling Company, whose plant is in Guanajuato, Mexico. It is to be a 100 stamp mill with plates, Wilfley concentrating table and complete steel cyanide plant, equipped with Blaisdell discharges, mechanical distributors, &c. The plant will also include a tube mill for regrinding. The capacity of the mill will be 250 tons daily. The present mill has 70 tons daily capacity. Alvin B. Carpenter, a mining engineer of Mexico City, has spent the last two weeks in Milwaukee in behalf of this plant.

The Keller Mfg. Company, Sauk Centre, Minn., is in the market for an electric welding machine for welding hub bands; also one shot feed saw mill, with hand or gang saw, and 150 horse-power boiler to burn green sawdust and green slabs.

The Poole-Bosworth Company, Crawfordsville, Ind., manufacturer of galvanized builders' supplies, will make extensive improvements at the site of the present factory at a cost of about \$10,000. Of this amount \$4000 will be spent for new machinery. A two-story addition to the factory, 35 x 150 feet, will be made. The growth of the business has been rapid and these enlargements are necessary to accommodate the demand.

The Strang Engine Company contemplates the purchase of a traveling crane and other foundry equipment for a foundry which it intends to equip in connection with its plant at Harvey, Ill. The address of the firm is 142 Dearborn street, Chicago.

The W. Smith Grubber Company, La Crosse, Wis., has purchased a 10-acre site in La Crescent, a suburb of La Crosse, on which will be erected a new plant.

Power Work.

Fritz Foltz, architect, 140 Dearborn street, Chicago, has made plans and will take figures on a substation to be built southwest from Kenosha, Wis., for the Chicago & Milwaukee Electric Railway Company. The building will be 40 x 115 feet, of fire proof construction, built of pressed brick and stone. Half of the building will be devoted to machinery, containing three 300-kw. rotaries, nine 110-kw. transformers and one booster, none of which has as yet been purchased. The north half of the building will be devoted to storage batteries.

The Interstate Traction Company, Hoopeston, Ill., has been organized to build an electric road from Danville, Ill., to Hoopeston. Right of way is now being secured and a large power house will be erected at Hoopeston. J. H. Dyer is general attorney for the road.

B. S. Kincart, Lebanon, Ky., engineer in charge of the Campbellsville Electric Light plant, will purchase about July 25 the following equipment: One 60-kw. 220-volt direct current generator; one 90 horse-power engine, automatic side crank, speed about 175; one fire tube boiler, 66 inches diameter and 16 feet long; one inclosed feed water heater; one duplex feed water pump.

The Helena Power Transmission Company, Helena, Mont., a subsidiary company of the Missouri River Power Company, is about to undertake the construction of a new dam and power plant on the Missouri River, about 15 miles below the present plant of the Missouri River Power Company. The plant will have a head of about 60 feet and a capacity of about 20,000 horse-power. The power will be transmitted in part to Helena and Butte and in part to Anaconda. The Missouri River Power Company's transmission lines will be extended from Butte to Anaconda, making a total distance of transmission from the new plant to the city of Anaconda of about 100 miles. This transmission will be operated at 70,000 volts. M. H. Gerry, Jr., is general manager of the Helena Company.

The Aultman-Taylor Company, Mansfield, Ohio, was awarded a contract by the city of Chicago for furnishing six horizontal water tube boilers for installation in the pumping station at Thirty-ninth street. Each boiler is to have not less than 2640 square feet of heating surface. Aultman-Taylor chain grate stokers are included in the contract.

Philadelphia Machinery Market.

PHILADELPHIA, July 11, 1905.

The local machinery market was rather quiet during the week past. This, however, was by no means unusual, as there is a general disposition to take matters more easily at this season of the year and buying consequently weakens for a time. On the whole, however, there is no complaint as to the volume of business taken; some manufacturers of heavy tools have, since the first of the month, taken on new business equal to their daily capacity and feel gratified at such a showing at this period. There appears to be scarcely any let up in the volume of inquiries being received, although it is possible that orders will not be placed as promptly during the next 30 or 60 days as is the case at other seasons of the year. The various railroads have placed some good inquiries on the market recently; the Pennsylvania Railroad is out with specifications for a number of tools, including a number of lathes, for both their Altoona and Trenton shops, while smaller specifications for tools for both Southern and Western roads have been received.

Manufacturers of tools and machinery generally have enough orders on their books to keep plants running regularly, and it is confidently believed that, while there will be no rush of business in the near future, there will be enough to go comfortably around. There is a better foreign inquiry in some lines, mostly specialties, however. Some manufacturers doing a regular export business note a slight improvement in the number of orders received, but as yet the machine tool trade is not feeling any material benefit from this trade.

There is a somewhat better demand for castings, more particularly steel castings, although in some cases gray iron foundries also find it difficult to meet the demand. The general run of jobbing foundries could, however, handle considerably more business without difficulty.

The Taylor-White Extracting Company, Camden, N. J., is asking for bids on several new buildings to be erected at its works at Coopers Creek and Pine street. The improvements consists of an extracting house, 70 x 129 feet, and a warehouse, 67 x 128 feet. A boiler and engine house and an office building are also to be erected.

Nathan Snellenberg will erect a modern manufacturing building on Wallace street above Broad. It will be a six-story and basement structure of the slow burning construction type and will measure 60 x 180 feet on ground plan. The operation will cost \$100,000 and contract for building has been awarded to William Steel & Sons of this city.

The Wm. Wharton, Jr., Company, Incorporated, has taken out city permits for the erection of a foundry building 57 x 247 feet, two stories high, at the corner of Twenty-fifth and Elsworth street, and alterations and improvements to its pattern shop and pattern storage building adjoining. The cost of the improvement is estimated at \$35,000.

The Standard Pressed Steel Company, manufacturer of the American Pioneer pressed steel shaft hanger, continues busy. Inquiries are numerous, particularly from foreign sources, in the interest of which Harold H. Gade, vice-president of the company, is now abroad and will establish agencies for these hangers in England and on the Continent. This company has recently shipped a number of good orders to parties in England, Germany and the Continent, and also finds its domestic business to be improving regularly.

Manning, Maxwell & Moore report a very good business considering the season. Inquiries, which had fallen off during last week, have again improved and several nice propositions are now being figured on. They have recently taken contracts for a number of heavy tools, lathes, grinders and drills for both the League Island and the Norfolk navy yards for the United States Government, and have several other good orders in sight which are expected to be closed during the present week.

The Newton Machine Tool Works, Incorporated, has received a number of orders for heavy machine tools since the first of the month and is well pleased with the general conditions of the trade. Some recent orders include a heavy slab milling machine, 16 feet long by 40 inches wide and 40 inches high, for one of the shops of the Rock Island Railroad. No. 3 combination cold saw cutting-off machines have been sold the American Locomotive Company for its Schenectady plant; Orford Copper Company, Bayonne, N. J., and the "Sunset Route" for one of its California shops. Two heavy steel foundry shapers—one 16 and one 18 inch slotter; bar saw for the Erie Foundry Company, Erie, Pa.; special portable milling machine for the General Electric Company, Lynn, Mass., and four rail drilling machines for the Dominion Iron & Steel Company, Sydney, N. S., are included in the present month's sales.

The Tabor Mfg. Company advises us that its business for the first six months of the year has far exceeded, both in point of orders and number of molding machines delivered, any like period since the formation of the company. Inquiries continue good and promise even a better business during the last half of the year. Among recent orders taken may be mentioned two 13 x 18 inch power ramming split pattern molding machines, two 12-inch power rammers and two 18-inch square Draper-Tabor machines for New England parties. Two 12-inch power ramming machines and six large Draper-Tabor machines for special heater and stove work have been sold an Ohio stove works, while two 14 x 16 inch split pattern and a 12-inch power ramming machine have been bought by a New Jersey foundry. Foreign demand for molding machines continues good; orders have been taken for a 16 x 16 inch and a 12 x 20 inch split pattern machine for export to Great Britain, while several good inquiries are in hand from Australia and the Continent. Sales of Taylor-Newbold cold saws are also reported very good, and orders for a number of 18, 26, 32, 36, 40 and 48 inch saws have recently been booked.

The Great Northern Power Company, Duluth, Minn., which is putting in a large hydro-electric plant, has just contracted with the Excelsior Wooden Pipe Company, San Francisco, for 1,200,000 feet of redwood staves, 1,800,000 pounds of steel bands and 300,000 pounds of malleable iron shoes. The cost of the whole is approximately \$200,000. The pipe company places the pipe ready for use. There are to be three of these stave pipes, each 7 feet in diameter and 12,000 feet long, extending from the company's forebay down the slope of the hill until a pressure of 164 pounds per square inch is attained. From this point, to the power house, where the head is 278 feet, steel pipe will be used.

Cincinnati Machinery Market.

CINCINNATI, OHIO, July 11, 1905.

This is the season of the year when it is expected that trade will slump off considerably and move along in a humdrum manner until cooler weather approaches. Such, however, is not the case at the present time in machinery circles. Trade is reported as being well sustained in all its branches as applied to machine tools, and while it is possible that orders are being received with a little less regularity than during the several months preceding it is quite evident that the major portion of the shops have sufficient business to keep them running to full capacity for some weeks to come. This business is well divided between foreign and domestic points and is far reaching in its character. Prices are said to be well maintained, the tendency being toward a stiffening along this line. This city has been experiencing quite a boom in the building line. The records show that during the first six months of the year 216 more permits were issued, representing an increase in cost of \$1,922,365 over the corresponding period in 1904. A large proportion of these buildings are constructed of steel; consequently the architectural people are having their hands full. The strike among these workers delayed matters for a time, but everything is now running smoothly and satisfactorily.

The new plant of the Ahrens Fire Engine Company, situated on Alfred and Cook streets, is rapidly nearing completion. This building is three stories high, with a basement, fronting 118 feet on Alfred street and 98 feet on Cook street, and will contain 35,000 square feet floor space. The company is now installing a portion of the equipment, which consists of lathes, planers, shapers, milling machines and drills. A part of this equipment has been purchased, but this will be increased to meet the demands of the occasion. The offices are on the second floor and are well equipped for comfort and convenience. This company was organized and incorporated under the laws of Ohio several months since with a capital of \$100,000. The incorporators are G. F. Ahrens, Charles H. Fox, John P. Ahrens, George W. Krapp and J. P. Ahrens. The officers are: G. F. Ahrens, president; Charles Fox, vice-president; George W. Krapp, secretary and treasurer. All of these gentlemen are well known throughout the country in fire engine circles, and as their facilities for building these engines are the best a large trade is anticipated.

The King Machine Tool Company says that trade is very satisfactory and that it is quite busy. It is getting out a new line of boring mills that it anticipates will prove very satisfactory to the trade. The company has recently added to its equipment a Norton grinder, a Pratt & Whitney thread miller and a Gleason gear planer.

Greaves, Klusman & Co. report an exceptional trade for this time of the year. They have added considerable floor space to the second and third stories of their plant and are now in a much better condition to care for their trade. Foreign demand with them is not very heavy at present, most of their trade originating in this country.

The Cincinnati Milling Machine Company remarks that it has been unable to notice any decline in the way of orders. The question of deliveries, however, is a very difficult problem, which cannot always be solved to its satisfaction. The company hopes before long to be in condition to take care of anything that may offer, as the additional buildings that it is erecting are progressing rapidly to a finish.

The Cincinnati Machine Tool Company reports more business this week than last. A fairly normal inquiry is present most of the time and demand is moving along in easy flowing channels.

New England Machinery Market.

WORCESTER, MASS., July 11, 1905.

Business has kept up very well during the past week. Considering the season and the hot weather, conditions are excellent in all lines of manufacture and trade. Several nice orders for machine tools have been placed within a few days, so that some dealers and manufacturers are feeling unusually cheerful. The labor bureaus still report that in metal lines the number of men given employment by the manufacturers exceeds the number that is laid off, which is an unusual condition for midsummer. Altogether there is cause for general satisfaction that the summer is panning out so well, much better than was generally anticipated, though machine tool men known to be shrewd observers had prophesied just what is happening.

It is announced that the John T. Robinson Company, Hyde Park, Mass., manufacturer of paper box machinery, has absorbed the business of the Consolidated Box Machine Company, Lynn, Mass., the combined business to be conducted under the John T. Robinson Company's name at the Hyde Park shops. The two companies have been competitors on some lines. There is ample space in the Robinson shops for the increased business and no new machine equipment will be required at present. George E. Gooding and Eugene H. Taylor of the Consolidated Company will remain with the business.

The Woonsocket Machine & Electric Company, Woonsocket, R. I., is installing two 1200 horse-power Curtis steam turbines, which will operate a new street railway between Woonsocket and Providence. The company states that the question of additional boiler capacity will be taken up a little later.

The attempt to consolidate the electric car building industry of the United States, which was referred to in this column in the issue of May 4, does not seem to have progressed to any extent during the past two months. We understand that the project has by no means been abandoned and that its promoters still believe that the plan will be culminated later on, but up to the present nothing is settled. Various attempts have been made in the past to bring about a similar consolidation, but have fallen through, and this may be the fate of the present plan. The companies named in connection with the consolidation are the St. Louis Car Company, St. Louis; J. G. Brill Company, Philadelphia; Wason Mfg. Company, Springfield, Mass.; Osgood Bradley & Sons Company, Worcester, Mass.; Laconia Car Company, Laconia, N. H., and the Jewett Car Company, Akron, Ohio.

The committee of the National Machine Tool Builders' Association appointed to consider the matter of readjustment of prices on motor driven and geared head lathes has not as yet taken action, and doubtless the matter will lie over until fall because of the practical impossibility of getting together a committee of this description during the midsummer months. It had been hoped that the readjustment of prices would have been announced by now, but unfortunately this could not be brought about. In the meantime some of the lathe manufacturers are making preparations for the time when the change in prices will go into effect. In fact, it is stated that individual manufacturers will make an advance without waiting for the committee's report, discounting the decision as to what the readjustment will amount to. A change in price of geared head lathes may very well be made, because no machine tool is in greater demand than these. Some of the lathe builders who specialize on this type of machine have orders which it will take them weeks, even months, to fill. The same thing is true to a lesser extent of electric driven lathes, the demand being on a constant increase as compared with belt driven machines. Consequently a readjustment which means a substantial average increase in price would not be considered unfair, because it is warranted by the demand, and at the same time the present prices of both geared heads and motor driven lathes are considered too low. Certainly the present prices leave little profit.

The N. B. Dodge Mfg. Company, Fitchburg, Mass., manufacturer of railroad supplies, including sand pipe cleaners, injectors, steam valves, boiler checks, track sanders, &c., is moving its works to Easthampton, Mass., where the Sawyer & Wolfe mill will be occupied. The purpose of the removal is to secure a larger plant, for which new machine tools will be needed after a little time. At present the company has its brass castings manufactured outside, and the plan is to establish a brass foundry later.

Capt. W. S. Moore, U. S. N., has been assigned as head of the department of steam engineering at the Charlestown Navy Yard. He was recently inspector of vessels in process of construction at private yards.

The Norton Grinding Company, Worcester, Mass., builder of grinding machines for heavy cylindrical work, has made a change in its line. Its 12-inch machine has been replaced by one with 14-inch swing, it having been found that the 12-inch size was heavy enough to permit of the change without otherwise changing the machine. This makes the three sizes 10, 14 and 18 inch.

Government Purchases.

WASHINGTON, D. C., July 11, 1905.

The Isthmian Canal Commission will soon ask bids for two dipper dredges, each dredge to have buckets, for operating in stiff clay or mud and rock. The boilers should be of sufficient size to furnish steam at 125 pounds pressure and of the Scotch marine type. One of the dredges is to be erected and completed at Cristobal and the other at La Boca.

The Isthmian Canal Commission is about to issue proposals for two steam hammers, two radial drills, two 14-inch grinding machines, 24 emery wheels, one portable cylinder boring machine, two Peerless No. 3 pipe and bolt cutting machines, 24 wet emery wheels, 24 carborundum wheels, &c.

Bids are asked by the Isthmian Canal Commission until August 11 for asphalt melting furnaces, steam roller, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 25 for a quantity of supplies for the Portsmouth, Boston, Newport, New York and League Island navy yards, including ventilating sets, traveling hoists, &c.

Under bids opened June 27 for machine tools for the various navy yards the following awards have been made:

Niles-Bement-Pond Company, New York, class 61, two traveling cranes, \$12,470; class 192, one engine lathe, \$130; class 193, one motor driven 16-inch lathe, \$631.

Industrial Works, Bay City, Mich., class 36, one 10-ton locomotive crane, \$5225; class 95, one 10-ton locomotive crane, \$4420.

Prentiss Tool & Supply Company, New York, class 150, one metal cutting band saw, \$318; class 153, two vertical milling machines, \$1798; class 154, one vertical milling machine, motor driven, \$1829.

Manning, Maxwell & Moore, New York, class 144, two screw cutting engine lathes, motor driven, \$1280; class 149, one sensitive drill press, \$110; class 191, four hydraulic jacks, \$189.48.

Browning Engineering Company, Providence, R. I., class 94, one 10-ton locomotive crane, \$4670.

Buffalo Forge Company, Buffalo, N. Y., class 123, one combined blower and exhauster, \$340.

General Electric Company, Schenectady, N. Y., class 141, one 4 horse-power motor, \$210; class 142, two shunt wound 40 horse-power electric motors, \$1130.

Vandyck-Churchill Company, New York, class 145, two screw cutting engine lathes, motor driven, \$1556; class 151, one cold metal sawing machine, \$1143; class 152, one vertical boring and turning mill, motor driven, \$2260.

Jones & Lamson Machine Company, Springfield, Vt., class 146, one flat turret lathe, \$1615.

S. A. Woods Machine Company, South Boston, Mass., class 147, one automatic knife grinder, \$560.

H. A. Rogers Company, New York, class 148, one hydraulic 100-ton forcing press, \$347.50.

Royce & Ricketts, Washington, D. C., class 162, one No. 11 pipe cutting and threading machine, \$825; class 163, one No. 7 pipe cutting and threading machine, \$525.

Central Metal & Supply Company, Baltimore, Md., class 164, one hand pipe machine and five three-wheel pipe cutters, \$70.75.

F. S. Banks & Co., New York, class 188, three blacksmiths' forges, \$47.85.

Oliver Machine Company, Grand Rapids, Mich., class 193, one universal tilting table, \$765; class 107, one wood trimmer, \$155.

Hendey Machine Company, Torrington, Conn., class 195, one motor driven pillar shaper, \$775.

J. B. Kendall, Washington, D. C., class 202, one noiseless steel pressure blower, \$32; class 243, ten blacksmiths' forges and 15 portable rivet forges, \$555.

Fairbanks Company, New York, class 232, one motor driven metal saw, \$169.

Sherman, Brown & Clements Company, New York, class 242, 34 hydraulic jacks, \$1150.90.

Class 196, one improved jointer and fencing machine; class 199, one motor driven grinding and polishing machine; class 200, one 13-inch sensitive drill press; class 201, three metal saw machines, have been canceled.

The following awards have been made for supplies for the various navy yards, bids for which were opened June 20:

Manning, Maxwell & Moore, New York, class 119, one Worcester twist drill grinder, \$190; class 120, one universal disk grinder, \$315.

Niles-Bement-Pond Company, New York, class 139, one cold saw, mounted on turntable, \$1795; class 151, one motor driven shaper, \$860.

Prentiss Tool & Supply Company, New York, class 112, one No. 3 horizontal boring and drilling machine, with 5 horse-power motor, \$2420.

Vandyck-Churchill Company, New York, class 114, one vertical drilling, boring and turning mill, \$1450.

J. A. Fay & Egan Company, New York, class 124, one motor driven wood lathe, \$711; class 136, one hand planer and jointer, \$528.

Brown & Sharpe Mfg. Company, Providence, R. I., class 132, one No. 0 plain milling machine, \$512.

Tatum & Bowen, San Francisco, Cal., class 65, one improved hand jointer, with motor, \$343.

H. P. Smith Machine Company, Smithville, N. J., class 66, one band saw, with motor, \$355.

Berlin Machine Works, Beloit, Wis., one three-drum sanding machine, with motor, \$1875.

Henshaw-Bulkley Company, San Francisco, Cal., class 68, one single drive flat turret lathe, \$1665.

Harron, Rickard & McCone, San Francisco, Cal., class 69, one motor driven hand jointer, \$425.

Under bids opened May 23 for machinery for the various navy yards the following additional awards have been made:

Niles-Bement-Pond Company, New York, class 22, two 36-inch engine lathes, with 12-foot bed, motor driven, \$4020; class 61, one boring and turning mill, \$3265.

Royce & Ricketts, Washington, D. C., class 37, one full universal radial drill, \$950.

Vandyck-Churchill Company, New York, class 53, two pipe machines, for cutting and threading pipe, complete with motors, \$1170.

The second Simplon tunnel through the Alps was pierced July 6. The first tunnel was completed last February.

The Production of Manganese Ores in 1904.

WASHINGTON, D. C., July 11, 1905.—The annual report of the United States Geological Survey on the production of manganese ores in 1904, prepared by John Birkinbine, shows an output of 3146 gross tons, valued at \$29,466, or \$9.37 per ton. This is 321 tons, or 11 per cent., more than the quantity reported in 1903. In 1904 only three States—California, Utah and Virginia—supplied manganese ore, but manganiferous iron ore was obtained in Colorado, Arkansas and in the Lake Superior region. Georgia and Arkansas, which in former years were important contributors, reported the mines idle. Of the 1904 total, 3054 tons, or 97 per cent., came from Virginia; 60 tons, or 2 per cent., from California, and 32 tons, or 1 per cent. from Utah.

Manganiferous Iron Ores.

In addition to the true manganese ores, considerable quantities of manganiferous iron ore are obtained. In Arkansas 600 tons of this class of ore, carrying 28 per cent. of manganese and 10 to 14 per cent. of iron, were mined and shipped out of the State, to be used in the manufacture of pig iron. The Colorado manganiferous iron ores, many of which contain varying amounts of silver, are primarily utilized as flux by the precious metal smelters, the remainder being used in the manufacture of spiegeleisen. In the Lake Superior region quantities of iron ore are mined which analyze from a fraction of 1 per cent. up to 20 per cent. of manganese. Some of these ores from the same exploitation are used as iron ores and some in the production of spiegeleisen; hence it is impossible to segregate closely the quantities so used.

The quantities of manganiferous iron ore mined by States in 1904, together with total and average value per ton, were as follows: Arkansas, 600 tons, valued at \$1200, or \$2 per ton; Colorado, 17,074 tons, valued at \$54,104, or \$3.17 per ton; Lake Superior region, 365,572 tons, valued at \$636,173, or \$1.74 per ton; total, 383,246 tons, valued at \$691,477, or \$1.80 per ton. The total production of manganiferous iron ores in 1903 was 584,493 tons, valued at \$1,571,750, or \$2.69 per ton.

In mining silver ores in Colorado mineral is obtained which contains insufficient percentages of the precious metal to make it valuable on that account, but which is used as a flux by the smelters. This ore is considered an iron ore. In 1904 there were mined 105,278 tons, valued at \$348,132, or \$3.31 per ton, as compared with 179,205 tons, valued at \$649,727, or \$3.63 per ton, in 1903. The largest recorded output of manganiferous silver ores was in 1901, when the total was 228,187 tons, valued at \$865,959, or \$3.79 per ton.

A by-product in the manufacture of zinc from ores mined in northern New Jersey containing iron and manganese is utilized in the production of spiegeleisen. In 1904, 68,189 gross tons of this class of ore were obtained, as compared with 73,264 tons in 1903. The maximum production of this material was recorded in 1900, when the output was 87,110 tons. For the past four years this product has been given a nominal value of \$1 per ton.

Summary of Production.

The total quantity and value of manganese ore, manganiferous iron ore, argentiferous manganiferous ore and zinc residuum produced in the United States in 1904 are presented in the following table:

Kind of ore.	Quantity. Gross tons.	Value.	Average value per ton.
Manganese ores.....	3,146	\$29,466	\$9.37
Manganiferous iron ores.....	383,246	691,477	1.80
Manganiferous silver ores.....	105,278	348,132	3.31
Manganiferous zinc residuum.	68,189	68,189	1.00
Totals.....	558,859	\$1,137,264	\$2.03

The greater portion of the manganese finds its principal use in the manufacture of steel. It is imported from foreign countries either in the manufactured forms of spiegeleisen or ferromanganese or as ore to be smelted in the American furnaces. The quantity of ore imported in the year ending December 31, 1904, was 108,519 gross tons, valued at \$901,592, an average of \$8.38 per ton, as against 146,056 tons, valued at \$1,278,108, brought in

in 1903. The principal contributor was Brazil, 66,875 tons, followed by Cuba, 16,239 tons; Russia, 11,959 tons, and British East Indies, 10,200 tons. Smaller quantities, which, from the high valuations, were evidently imported for some other content than manganese, came from Germany, Japan, United Kingdom, Canada and Belgium.

Relation of Imports to Production.

That the United States is dependent upon foreign sources for the major portion of its manganese ores is evident from the figures heretofore presented. For 16 years the average annual production of domestic manganese ore has been 12,174 tons, valued at \$109,423, while for the same time the average quantity imported was 105,720 tons, valued at \$950,508.

In the calendar year 1904 there were produced in the United States 57,076 tons of ferromanganese and 162,370 tons of spiegeleisen, and there were imported 21,813 tons of ferromanganese and 4623 tons of spiegeleisen, a total of 245,882 tons. When the foreign prices are low the importations are augmented, for it may be more advantageous to purchase foreign metal than to import ores of manganese and smelt them. In the fiscal year ending June 30, 1904, there were imported into the United States 23,903 tons of ferromanganese and 50,620 tons of spiegeleisen, the combined value being \$2,080,645. Commercial ferromanganese may be considered as containing 80 per cent. of manganese, and spiegeleisen as carrying 20 per cent. of manganese.

The output of manganese ores in those countries producing more than 25,000 tons for the latest year for which returns are available was as follows: Russia, 451,464 tons; India, 165,006 tons; Brazil, 159,369 tons; Germany, 47,994 tons; Turkey, 49,100 tons, and Spain, 26,895 tons.

W. L. C.

The Production of Tin in 1904.

WASHINGTON, D. C., July 11, 1905.—The production of tin ore in the United States in 1904 amounted to 159 net tons of concentrates, which contained 70 per cent. of metallic tin, and was obtained from South Carolina, South Dakota and Alaska, according to the annual report of the United States Geological Survey, which has been compiled by Joseph H. Pratt. Nearly all of the concentrates were shipped to England for smelting.

The source of the world's supply of tin is a matter that is assuming considerable importance, for during the last few years the production of tin in the world has not been equal to the demand, and the accumulated stocks of tin that have been held in various countries have become very much diminished since 1896. Of all the tin produced in the world approximately 40 per cent. is consumed in the United States, and until the last year or two there has been practically no production of this metal in this country. In 1904, however, tin was produced in Alaska, South Carolina and South Dakota, and although the production was very small as compared with the total consumption of tin in the United States, it may be the beginning of what may become an important industry in this country.

On account of the demand for tin and the high price it brings, a new industry was started a few years ago which is known as detinning tin scrap, and this has now become of considerable importance in the United States. Many hundred tons of metallic tin and chemical salts of tin, chiefly chlorides, are obtained each year by the chemical or electrolytic treatment of new tin scrap, which is obtained from can factories. Old tin cans and similar material are subjected to a smelting treatment by which also the tin is recovered, and such tin is either used in a crude and impure condition in the manufacture of solder or is treated chemically to yield metallic tin or tin salts. The residue of iron obtained in these processes, which contains a little tin, is melted and cast into sash weights and other objects where the small percentage of tin in the iron is not an objectionable feature.

Considering the existing conditions in the tin industry, it is no wonder that any new discovery of tin ore arouses considerable interest and that capital is available for development of the deposits to prove their actual commercial value. During the last year development work

has been continued at the tin deposits in the vicinity of Kings Mountain, N. C. and near Gaffney, S. C.; at the Tinton deposits of South Dakota, and at the Buck Creek deposits of Alaska, and from all three of these localities there was a small production of tin ore.

World's Production of Tin.

On account of the output of the metal tin being largely from countries where no accurate statistics of the production can be obtained, it is only possible to give approximate figures regarding the world's production. In the following table there is given an approximate idea of the production of tin, by countries, during the last ten years, which shows the growth of the tin industry as well as the yearly production of each of the countries named:

Country.	1902. Gross tons.	1903. Gross tons.	1904. Gross tons.
Malay States.....	53,756	54,797	58,637
Banka and Billiton.....	18,765	20,060	14,639
Bolivia	10,150	9,500	9,200
Cornwall, England.....	3,950	4,150	4,282
Australia	3,206	4,991	5,082
Miscellaneous	350	395	384
Totals.....	90,177	93,893	92,243

As is seen from this table, there was a slight decrease, amounting to 1650 tons, in the estimated production of tin in 1904 as compared with 1903.

Consumption in 1904.

The consumption of tin during 1904 has been estimated at approximately 94,755 tons. These figures, compared with the world's production, show that the consumption was greater than the production by 2512 gross tons. In the following table are given the estimated quantities of tin consumed in the various countries:

Country.	Quantity. Gross tons.	Per cent.
United States.....	38,500	40.6
Great Britain.....	15,898	16.8
Germany	14,832	15.7
France, Italy, Spain and Russia.....	17,920	18.9
Eastern Europe and South America.....	4,305	4.5
Eastern Asia.....	3,300	3.5
Total consumption.....	94,755	100.0

Imports.

The tin imported into the United States for the fiscal year ending June 30, 1904, was obtained, according to the report of the Bureau of Statistics of the Department of Commerce and Labor, from the countries named in the following table, which also gives the quantity and value for the years 1903 and 1904:

Country.	1903.		1904.	
	Quantity. Net tons.	Value.	Quantity. Net tons.	Value.
Malay Peninsula.....	23,592	\$12,715,875	16,579	\$8,725,824
Great Britain and Dominion of Canada.....	17,591	9,374,563	21,790	11,720,453
Netherlands	1,726	944,304	934	466,109
Other European countries	833	441,114	334	183,184
Australia	224	119,851	309	164,213
Japan	42	23,095	11	5,945
Other countries.....	...	...	416	220,583
Totals.....	44,008	\$23,618,802	40,382	\$21,486,311

It will be seen from this table that the quantity quoted as having been imported from Great Britain in 1904 is nearly five times that produced in England, and this is due to the fact that a considerable portion of the tin produced in the Malay Peninsula is shipped from Singapore to Great Britain, and is in turn imported from there into the United States. The tin exported from the Netherlands represents the metal obtained from the islands of Banka and Billiton, and some of the tin imported from other European countries was obtained from Bolivia. From this it will be seen that the greater part of the tin consumed in the United States is produced in the Malay Peninsula.

Prices.

The average price of tin during the month of January, 1904, was 28.84 cents, but in the following June it was quoted at 26.23 cents, the lowest point during the year. A steady rise was noted thereafter and the closing price in December, 29.28 cents, was the highest of the year, the average for the year being 27.99. This record is the reverse of that for the year 1903, when tin sold for 30.15 cents in March and declined to 25.42 cents in November.

W. L. C.

New Publications.

Jahrbuch der Automobile und Motorboat Industrie.

(Annual of the Automobile and Motor Boat Industry.)

By Ernst Neuberg. Published by Ball & Pickardt, Berlin. Price, 12 marks.

Under the auspices of the German Automobile Association Ernst Neuberg, an engineer, issues the second annual of progress in the automobile and motor boat industry. It is an admirable, systematic review, making a volume of over 500 pages, profusely illustrated, divided into chapters, the different branches of the subject being handled by specialists. Thus Max R. Zechlin discusses fuels; Joseph Loewy of the Austrian Patent Office, electric motors; A. Altman, steam cars; E. Dalchow, machine tools for the automobile industry; Julius Kuester, engines and transmission; Loew, motor cycles; F. F. Alberti, motor boats, and Captain Gross, motor airships. There is, too, a summary of the German, Austrian, English and American patents.

Der Steinkohlen Bergbau in der Umgebung von Saarbruecken. (Coal Mining in the Vicinity of Saarbruecken.) Published by Julius Springer, Berlin.

A characteristically German piece of work has just been issued in the form of a series of monographs describing the coal mining industry of the Saarbruecken district, which is controlled by the Prussian State. It is divided into six parts, one of which, however, has not yet been issued. The first, prepared by A. Prietze, Dr. Leppla R. Mueller and M. Hohensee, all Government officials, deals with the geology of the basin and with the character of the coals. The second, by A. Hasslacher, traces the history of the Saar coal mining industry, which began at a very early date, the records pointing to work early in the fifteenth century. Coking began on a large scale in 1860 as the basis of the large iron industry of the district. In 1902 the production of coal reached 11,408,820 metric tons, while the output of coke was 928,500 tons. R. Zoerner, in the fourth part, presents a study of the markets of the Saar coal district during the past 20 years. The fifth section, by Mengelberg, is an elaborate technical description of the coal washing appliances and of the methods of coking. The last part, by E. Mueller, describes the development of the labor conditions from 1816.

The Pocket Book of Refrigeration. Edited by A. J. Wallis-Taylor, C. E. Publisher, Norman W. Henley Publishing Company, New York. Pages, 184; 4 $\frac{3}{4}$ x 6 $\frac{3}{4}$ inches. Illustrations, 29. Price, \$1.50.

The rapid extension of the use of refrigerating machinery has already led to the organization of the refrigerating engineers in one of the national engineering societies into an association of their own, and there is a demand for literature such as this volume supplies. The contents are arranged in six sections: Refrigeration in General, Cold Storage, Ice Making and Ice Storing, Insulation Testing and Management of Refrigerating Machinery, General Tables and Memoranda. The discussion of the general subject of refrigeration takes up 67 pages, and there are included many valuable tables relating to compressor capacity, pressure and boiling point of liquids, latent heat solubility and yield of anhydrous ammonia and volume of ammonia gas at various pressures and temperatures. The subject of testing and management of refrigerating machinery is treated at some length, and the general tables and memoranda constitute an important feature of the book.

The Temperature-Entropy Diagram. By Charles W. Berry, Publishers, John Wiley & Sons, New York. 12mo. Pages, 150. Illustrations, 49. Price, \$1.25.

The author, who is instructor in mechanical engineering in the Massachusetts Institute of Technology, prepared the contents of this volume for the use of students in thermodynamics. He has brought together in proper order information scattered through various works relating to the construction, interpretation and application to engineering problems of the temperature-entropy

diagram. The book is not intended for advanced students nor for those entirely ignorant of thermodynamics, but fundamental principles are shown, preparing the reader for more exhaustive works. There are 12 chapters, treating in order of Reversible Processes and Cycles, Perfect Gases, Saturated Steam, Superheated Vapors, Flow of Fluids, Hot Air Engines, Gas Engines, Nonconducting Steam Engines, Multiple Fluid Engines, Liquefaction of Gases, Compressors and Refrigeration and Actual Steam Engine Cycle as Recorded by the Indicator.

Patents: A Manual Relating to United States Patents, for Inventors and Patentees. Authors and publishers, Howson & Howson, Philadelphia, Pa. Pages, 96. Fourth edition.

This is a revision of a book originally issued with a view to giving in compact and accessible form answers to questions constantly coming up as to the law and practice of patents, trademarks and copyrights.

Steam Pipes: Their Design and Construction. By William H. Booth. Publisher, Norman W. Henley Publishing Company, New York. 8vo. Pages, 187. Illustrations, 62. Price, \$2.

The author observes in his preface that while steam pressures have advanced in recent years the area of pipes has not diminished accordingly. While steam pipes may be too small, he considers that they are probably more often too large. Thus the numerous details involved in flange diameters, bolts, center lines, sockets, joints and valves all demand investigation. The object of the work is to bring together such information concerning steam pipes as will be of assistance to the engineer who has to deal with these problems. The author considers that in view of the costliness of the item of steam piping, with the large valves now employed to-day, every effort should be made to diminish the cost without sacrifice of efficiency. The subject is discussed under the following topics: Flow of Steam, Materials, Expansion, Strength of Pipes, Pipe Joints, Pipe Supports, Valves, Junction Pieces and Flanges, Drainage, Separators, Superheated Steam, Weights of Pipe and General Arrangement. Under the head of materials, the author treats of cast iron, wrought iron, steel and copper, and a number of useful tables are given showing sizes of various materials in varying positions. He considers cast iron without a serious rival for general purposes up to pressures of 100 pounds per square inch gauge pressure. Above that pressure he doubts the propriety of using cast iron and at pressure above 120 pounds entertains very serious doubts, observing that the stresses in steam piping are not so much those of pressure as those which arise from expansion due to temperature changes and from water hammer, and perhaps more seriously from forcing pipes to fill places which they do not fit properly. For exhaust pipes cast iron holds the field, but the author regards the steel pipe par excellence the proper pipe for high pressure and for superheated steam. To the latter subject a chapter of considerable length is given. Perhaps more information might have been afforded on the subject of the strength of pipes, as well as on valves.

R. L. Farnham, director of the Panama Railroad, who has been in England and on the Continent for some weeks getting prices on steamships and steel rails, sailed for the United States on July 7, taking proposals from British and German firms for rails and from British shipowners and shipbuilders for steamers. Mr. Farnham took options on six vessels at prices below those at which the vessels could be bought in the United States. He has also proposals from shipbuilding firms in Great Britain which, he says, will deliver vessels in shorter time and at lower prices than American builders. Mr. Farnham says that English prices on steel rails were lower than American bids and German prices were still lower. No contracts have been made, but the proposals will be submitted to the board at Washington.

HARDWARE.

THERE has been for some time more or less in the way of restriction of prices in the relations between the manufacturers and the jobbing trade, and at the recent convention of the Southern Hardware Jobbers' Association there was a decided sentiment in favor of this policy. In our correspondence with merchants we are in receipt of expressions of opinion on both sides of the question which it is evident will receive a great deal of consideration on the part of manufacturers and merchants who are studying the present disturbed and perplexing situation in connection with the distribution of Hardware. In another column we give an interesting communication from a high official of a great jobbing house in which a forcible argument is made in opposition to restricted prices. While something is undoubtedly to be said on the other side, this letter deserves and will receive most careful consideration from all interested in the subject.

It is interesting as illustrating a general principle which applies in commercial matters to note how the law of supply and demand exhibits itself as a result of the consolidations of national banks in the smaller cities. A demand for new banks has been created where there was no logical reason for it other than that engendered by the fact of merging banking interests. The great centers of population and business where the fashion of bank consolidation followed hard on the footsteps of industrial combination have not yet needed new national banks because, though the number of these institutions has diminished greatly as the result of mergers, there are still a good many banks and excellent facilities, and the rapid increase in the number of trust companies has kept the aggregate up to the old figures and in some places has increased it. In several smaller communities where there were from five to a dozen national banks and consolidations have materially decreased the number, in some instances cutting it in two, the outcome has been the successful establishment of new banks. Up to the present there have been only a few such instances, but the beginning has been made and the practical certainty that their success has been established, and it is likely that others will follow wherever similar conditions shall exist. Quite an analogous condition of things is found in the mercantile and manufacturing field. The consolidating of interests or even the forming of a combination which gives control of the market acts immediately as a spur to new enterprise, and becomes the occasion of the establishment of competition which would not have found place under the old order of things.

Another potent principle in commercial life which of course holds in the Hardware as in other fields is illustrated in the success of these new banking ventures. The experience of some at least of the new banks has been notable in that they have almost immediately acquired a substantial and profitable volume of deposits. For example, in one city of 125,000 people a new bank had on deposit within three months of its beginning of business upward of \$1,000,000. This sum was not made up of a few large deposits, but was divided among a large number of average customers. This city needed, it is said, no additional banking facilities. If it had not been for the merging of five of its banks into one the establishment of a

new bank would have been considered impracticable. The apparent reason for success is that business men prefer the old intimacy possible with a bank of limited capital and consequently limited business than with a great institution where the necessary rush of the day's work does away with the possibility of close and confidential relations between customers and the cashier or president. The large financial institution undoubtedly possesses advantages as a result of its size and the increased facilities which are thus obtained, but at the same time it suffers corresponding disadvantages which are inseparable from because they are a result of its size and the consequent loss from the elimination to a certain extent of the personal element. These gains and losses are experienced as well by great manufacturing and mercantile concerns which make to their customers and to the trade at large a more remote and impersonal appeal than is made by their smaller competitors, some of whom have perhaps recently entered the field.

The importance of taking care of comparatively small accounts and unimportant customers finds an illustration also in the financial sphere. The great banks, having large sums of money to loan, naturally give better attention to large loans than to small ones. A few hundred dollars is a trifling matter, of hardly more importance than an order for a few pounds of goods received at the office of a large manufacturing establishment. The wise manufacturer, however, fosters this class of business, because he knows that in the future the unimportant customer may grow to be an important purchaser. The great bank realizes this as well as the manufacturer, but the details of management pile upon the working head of the institution, either the cashier or the president, and such matters as loans, however trifling, cannot be handed over to a clerk for settlement. They must be considered by some one in authority who must take the responsibility of the decision. Customers who are used to the conditions existing in the banks which have been absorbed into the one institution are piqued by the lack of the attention they have been accustomed to, not realizing that their affairs are of less relative importance to the great bank than they were to the old bank. Thus it will be seen that the laws of trade and the impulses and tendencies of human nature, which enter into such laws so largely, work together to make possible and to encourage the establishment of new enterprises, even in the presence of formidable and, perhaps, dominant rivals, who are in possession of the field. There is still fortunately a chance for the newcomer.

Condition of Trade.

Business as a rule is restricted within narrow bounds, being limited for the most part, so far as the relations between manufacturers and merchants are concerned, to orders for the goods which are needed promptly for the completion of assortments or the supply of special requirements. As usual at this time there is comparatively little stock ordering, both the season and the condition of the market conspiring against any large purchasing. In a few lines there is owing to special circumstances a good deal of activity. The advances in cotton are having a decided effect on the prices of Cotton Rope, Sash Cord and other goods. While the market in general is thus characterized by a wholesome quiet there is an excellent feeling in regard to future business in view of the fine crop prospects and other factors which promise prosperity.

Chicago.

Most of the jobbing firms find by comparing the figures of the first half of this year with previous years that a comfortable increase both in volume of business done and in profit accruing is reflected, notwithstanding the fact that unseasonably cold weather prevailed during the months of May and June. The tone of the Hardware market is strong, and there is every prospect for excellent business throughout the second half of the year. Jobbers are beginning to ship fall goods on contract in order to make room in their warehouses, with the usual forward dating on invoices. Some lines of Hardware are showing unusual strength and buyers are being warned by manufacturers that it will be wise for them to close contracts early as a protection against probable advances. Notable among these are Picks and Mattocks, Copper Bottom Kettles and Boilers and Nickel Plated Goods. Trade in Dairy Supplies, including Milk Cans, has been larger during the last six months than in any other period in the history of the business, and demand at the present moment for Fruit Canning Supplies is exceptionally active. The Michigan peach crop bids fair to be a very heavy one and the fruit crop in general is so large that it seems quite certain that an exceptionally heavy business will be done in Cans and Canning Supplies of all kinds. Building operations have been extremely heavy in Chicago, and Builders' Hardware is correspondingly active. In June permits were issued for 790 buildings, aggregating \$7,710,000, which exceeds all previous records for June or any other month in the history of Chicago's Building Department. During the first six months of the year there were permits granted for 3710 buildings, aggregating about \$30,500,000 in estimated cost, which is also the record for any six months' period in the history of the city, exceeding the corresponding period last year by 418 buildings and \$11,600,000 in estimated cost, an increase of about 13 per cent. in number of buildings and 62 per cent. in estimated cost as compared with last year. Cotton Sash Cord has been advanced 1 cent a pound in sympathy with the higher prices on raw cotton. Wire products and Nails are strong for this time of year and production is being quite generally restricted. Sheets are weaker again, owing to the surrender of the Amalgamated union workers and the collapse of the consolidation scheme.

NOTES ON PRICES.

Wire Nails.—The market situation is satisfactory for the season and prices are well maintained, except at some competitive points, particularly in the South, and by some jobbers who are offering concessions in price to move stocks. While demand on mills is comparatively light at present their output is being more or less restricted. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....	\$1.80
Corloads to retailers.....	1.85

New York.—The demand from out of town merchants has been very satisfactory, but city trade has been quiet since the Fourth of July. The market remains firm and prices are unchanged, as follows: Single carloads, \$1.99; small lots from store, \$2.05.

Chicago, by Telegraph.—The usual midsummer dullness prevails and prices are unchanged in spite of the fact that there is but small demand on the mills. In a general way conditions are stronger than usual for mid-July and mills are well filled with business. Quotations are on the basis of \$1.95 in car lots to jobbers, \$2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—Demand continues light, as is usual at this season of the year. Stocks of Nails held by jobbers are being gradually reduced, and the mills are feeling the effects of this in a more liberal supply of orders. The tone of the market is fairly firm, but as noted last week prices are being shaded to some competitive points, notably in the South. Some of the jobbers who still have good sized stocks are also shading prices slightly

in order to move these out more freely. Prices of Wire Nails, which are sometimes slightly shaded, are \$1.80 in carloads to jobbers and \$1.85 to single carload buyers, actual freight from Pittsburgh being added.

Cut Nails.—Demand on mills is light and production is being kept down as nearly as possible to the actual requirements of the trade. Prices continue irregular, and for carload lots \$1.70, base, f.o.b. maker's mill, may be named. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails. These quotations are shaded quite frequently.

New York.—The demand for Cut Nails is about in the usual proportion to that for Wire Nails. New York quotations are as follows: Carloads on dock, \$1.89; less than carloads on dock, \$1.95; small lots from store, \$1.95 to \$2.

Chicago, by Telegraph.—There is scarcely sufficient trading to make a market, but this is a condition that usually prevails at this season of the year. Prices range quite generally from \$1.90 to \$1.95 for car lots to either consumers or merchants, with \$2 asked for reasonably large lots less than car lots. Store prices range from \$2 to \$2.10, according to size of order.

Pittsburgh.—Demand for Cut Nails is quiet, and the mills are keeping down output as much as possible to conform to actual demand. There is some irregularity in prices and we quote Cut Nails at \$1.65 to \$1.70, base, in carload lots, f.o.b. maker's mill. The lower price is made only to the large trade and for carload or larger orders. For Iron Cut Nails the mills charge from 5 to 10 cents advance over these prices.

Barb Wire.—A light demand from mill represents the seasonable condition of the market. There is some irregularity in prices, largely confined to some of the smaller mills and to jobbers who are anxious to close out stocks, both of whom are shading the official quotations given herewith. Quotations are unchanged, as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

Chicago, by Telegraph.—Trading is seasonably light and prices are unchanged. Official prices are as follows: Painted Wire, \$2.10; Galvanized, \$2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, \$2.25; Galvanized, \$2.55; Staples, Bright, in car lots to jobbers, \$2.05; Galvanized, \$2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Demand is quiet and there is more or less irregularity in prices, mostly among jobbers who have stocks bought at lower prices than are ruling now and are anxious to close these out. A few of the smaller mills are also shading the prices named below. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots.....	\$1.95	\$2.25
Retailers, carload lots.....	2.00	2.30
Retailers, less than carload lots.....	2.10	2.40

Smooth Fence Wire.—While buying is not active prices are generally firm, the shading of official quotations not being indulged in to any extent. The outlook for business in this line is regarded as favorable. A number of the mills are closed for annual repairs and stocktaking. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.65
Retailers, carloads.....	1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

Chicago, by Telegraph.—The outlook for business for the coming year is considered excellent and prices are firm notwithstanding the fact that both buyers and sell-

ers are taking their midsummer vacations. Quotations are as follows: On the basis of \$1.80 for Annealed, car lots to jobbers, and \$1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—The market is quiet and quite a number of mills are closed at present, making repairs and taking inventory. This restriction in output is expected to help the situation. There is some irregularity in prices named below, being sometimes shaded, but not to any extent. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....\$1.65
Retailers, carloads.....1.70

Horse Nails.—Two features of the Horse Nail market demand attention at this time, both of which are active in bringing about the present rather unsatisfactory conditions. In the first place there is a generally admitted overproduction amounting to a very considerable percentage of the total consumption of this commodity. How far such overproduction may be attributed to a failing demand, due to the much bruited "passing of the horse," the next few years will show. In the meantime the resulting low prices, ranging perilously near the cost to manufacture, have the effect of strengthening the position of the larger and more heavily capitalized concerns at the expense of their weaker competitors. There is apparent a tendency on the part of the manufacturers, especially those who are failing to find a sufficient market through regular channels, to sell direct to the consumer, approaching him with prices not much, if any, higher than they are quoting to merchants. Some of the manufacturers are apparently satisfied to employ their plants in making special brands for large handlers of Horse Nails, who in turn relieve them of the problems of marketing under the conditions which obtain. These are not in all cases goods of highest quality or established reputation.

Shot.—The opening of the Shot season finds the United States Lead Company still retaining practically unchallenged control of the production and the price of Shot. The company states that the beginnings of the fall demand are now being felt from the jobbing trade, and indications point to a better than average business. No change has recently been made in prices, which are given out under date of July 10 as follows, there being the usual abatement on ton lots of 10 cents per bag of 25 pounds; terms 30 days, or 2 per cent. for cash in 10 days:

Drop Shot, sizes smaller than B, per 25-pound bag.....\$1.65
Drop Shot, B and larger sizes, per 25-pound bag.....1.90
Buck and Chilled Shot, per 25-pound bag.....1.90
Dust Shot, per 25-pound bag.....2.25

Asbestos.—The prices of Asbestos products are in most instances substantially the same as those of last spring, when all the manufacturers perfected a working arrangement along agreed lines to secure uniformity in quotations. At that time the freight compact provided for a freight allowance of 30 cents per 100 pounds for destinations west of the Mississippi River, which is now modified to read as follows: "On shipments beyond the Mississippi River freight shall be prepaid to the Mississippi River only, but no freight allowance under any circumstances shall be allowed beyond the Mississippi River." The terms otherwise are still, goods delivered east of the Mississippi River, 30 days net and 2 per cent. discount in 10 days. The stock reason, increased cost of raw material, commonly given in connection with advances in prices of goods, is mentioned in this instance as affecting manufactured Asbestos. The price demoralization in Asbestos commodities, especially the staples, was such as to induce manufacturers a few months ago to come together and organize to work in harmony in selling prices, and crude Asbestos is approximately what it was when the agreement was concluded. Manufacturers as a rule make contracts for raw Asbestos for periods of one to five years. How costs may be affected as existing long time contracts lapse is a question, but undoubtedly Asbestos at the Canadian mines, where the best and largest quantity of it is obtained, will advance in the future from natural causes in the labor market. For a long time the French-Canadian labor was slow to demand a higher

wage, being content as a rule to accept the equivalent of \$1 a day. But wages have been raised in some localities to \$1.10, \$1.15 and \$1.25 per day and even higher, a situation which is bound to be reflected in the costs of Asbestos finished products. List prices are as follows: Paper, 1-16 inch thick and thinner, 6 cents per pound; Roll Board, 3-32 and 1/4 inch, 8 cents per pound; Wall Boards, 10 cents per pound, from which discounts are allowed according to quantity, as 5000-pound lots 40 per cent. discount and less quantity 33 1-3 per cent. discount, with a further discount on carloads. Wick and Rope are selling in 1000-pound lots at 17 cents per pound, less quantities at 20 cents per pound, with a lower price for ton lots.

Cotton Sash Cord, &c.—Owing to the recent advances in Cotton, manufacturers have made an advance in the price of Cotton Sash Cord of 1 cent per pound. Demand is so active that few makers are able to supply Cord as promptly as purchasers require. Cotton Mops, Wrapping Twine, Chalk and Seine Twine, Rope, &c., have also advanced 1 to 2 cents per pound. Cotton Twine is scarce, demand having been so great that some manufacturers are behind with their orders. They are not accepting orders for anything like prompt shipment, prices being those ruling at date of shipment. Other makers are refusing orders for any Cotton goods, as they have no means of knowing how high the price of Cotton may go.

Rope.—Considerable business has been done in Hay Rope during the past week or two, but outside of that demand has been barely satisfactory for the season. The market is weak, owing to lack of active demand, partly caused by absence of inducement to buy beyond actual requirements, owing to declining prices on fibers. General quotations, on the basis of 7-16-inch diameter and larger, are as follows: Pure Manila, 11 1/2 to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 cents per pound, the above figures being shaded 1/4 to 1/2 cent per pound, according to seller and buyer.

Window Glass.—As the result of a meeting held by Eastern jobbers on July 6, the following prices have been announced for hand made Glass: First two brackets, single strength B, 90 and 20 per cent. discount; all other sizes of single and double strength, 90 per cent. discount. It is understood that the American Window Glass Company has also advanced prices, but that it is not much of a factor in the business, as it has orders booked for all the Glass it can make during July and August. The situation in the Glass market is a strong one, and another advance in the near future is not improbable. It is reported that Western Window Glass jobbers will hold a meeting in Chicago on July 13, at which an advance of 10 per cent. in price will be made. Stocks in manufacturers' hands are lighter than for some years at this season, and if present demand keeps up desirable sizes will soon become scarce.

Oils.—**Linseed Oil.**—Since July 4 demand for carloads and less than carloads has materially improved. Present requirements, however, are only being covered and purchasers demand prompt deliveries, as they apparently wait until their stocks are nearly exhausted before placing orders. There is a marked absence of inquiries concerning the placing of contract orders. The market is firm at former quotations, which are as follows: City Raw, 50 to 51 cents per gallon, and State and Western Raw, 48 cents, both according to quantity.

Spirits Turpentine.—At the end of last week prices advanced, owing to the reported strength of the Savannah market, due to buying for export. Since that time the local market has declined owing to the lack of demand, but is still 2 1/2 cents above our last week's quotations. New York quotations, according to quantity, are as follows: Oil barrels, 61 1/2 to 62 cents; machine made barrels, 62 to 62 1/2 cents per gallon.

Paris Green.—On July 10 another advance of 2 cents per pound was made in the price of Green by the manufacturers, an advance of the same amount having been previously made on June 26. Considerable Green was sold by manufacturers during the month of June, and

they regard Northern demand about at an end. It is difficult and undesirable to manufacture Green in warm weather, so that little, if any, is made after the middle of June. Stocks in manufacturers' hands will therefore have to suffice for Southern requirements later in the season. Quotations for 5 tons or over are as follows:

Arsenic kegs.....	16 c.
Kegs, 100 to 175 pounds.....	16½c.
Kits, 14, 28 and 56 pounds.....	17½c.
Boxes, 2 and 5 pounds.....	17½c.
Boxes, 1 pound.....	18 c.
Boxes, ½ pound.....	19 c.
Boxes, ¼ pound.....	20 c.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds.....	1 c.
1000 to 5000 pounds.....	1 c.
500 to 1000 pounds.....	1½c.
Less than 500 pounds.....	2 c.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE,
NORFOLK ST., STRAND, LONDON, W. C. 1

The Week's Hardware Trade.

MORE activity has been observable this week in the Hardware industry and the outlook is more hopeful. Perhaps the most prosperous department is the Cycle trade. Up to Whitsuntide all records of output had been passed in one or two cases, and there is still sufficient pressure of work to prevent prompt delivery for orders now coming to hand. In view of the great increase in the motor industry, the increase in the number of Cycles produced is really remarkable. It is ten years since cycling became the fashion and there was a Cycle boom of almost unexampled dimensions. Nevertheless, there is reason to believe that at the present moment the output of Cycles is greater than was the case even at that time. The reduced prices which came into force last November have undoubtedly stimulated the demand for good machines, while the extension of the easy payment system has also stimulated sales. The War Office has placed a large contract with the Birmingham Small Arms Company, a bigger contract than expected. The Sporting Gun trade is disappointing on the whole. The improvement in the File trade is well maintained. File makers are among the first to feel the effect of any improvement in the trade of the country, and at present there is a greater demand for large Files than has been the case for some months past. This has arisen in consequence of the better outlook in engineering works. In some cases houses could scarcely have met their orders had it not been for the stocks they had provided in the slack time. The Sheep Shear trade continues fairly good, the demands from Australia and the Argentine being up to the average. The export demand is well maintained, one noticeable feature being large sales of Unenameled Hollow Ware. Australia is a good customer, as also New Zealand, and South Africa is buying in larger quantities and for prompt delivery. A steady trade continues with South America, India and Canada.

South African Prospects.

If South Africa can do a good export trade it follows that she will increase her purchases. It is, therefore, interesting to note that the Cape Colony exports for the first quarter of the present year reached an aggregate value of £7,784,000, as compared with £6,797,000 for the corresponding period of last year. Included in "merchandise" are raw gold and diamonds. These two items account for over six millions sterling of the whole business. Raw gold was exported to the value of £4,804,000, and diamonds represent £1,201,000, the former showing an increase of £1,113,000 and the latter a decrease of £14,000. Wool, ostrich feathers, copper ore, hides and skins and Angora hair are the remaining articles set forth in the tabulated statement. The other kinds of merchandise, which are not specified, reached a value of £582,000, against £48,000 for the first quarter of last year. There is an increasing tendency to order smaller quantities, and in cases where a few years ago an indent would come through for 100 articles the quantity is now for 25. The inference from this is that the area of distribution is being widened in South Africa.

Tools in Egypt.

A report issued this week on the trade of Alexandria is full of interest to exporters who have a market in Egypt. There are some points in a letter addressed to a British firm dealing in carpenters' and blacksmiths' tools, containing good advice to exporters, which is quite as relevant to Americans as to British traders. The letter says:

The difficulty with our principals arises from the fact that the native does not use the same tools as the British workman. Many modifications and additions have consequently to be made so as to adapt the tools to what is required on our markets. If it were a question of a few articles only the difficulty could easily be overcome by sending home samples, but as there are a thousand, and probably more, lines that have to be attended to you will easily understand how impossible it is for an agent, who is neither a carpenter nor a blacksmith, to give them all the particulars they want. We therefore suggested that they should send out either one of the partners in their firm or a competent traveler who, with our help, might secure the first orders. What we have to complain of most in the firms at home is that although our markets are invaded by an army of foreign travelers they (the British firms) don't take the trouble or care to incur the expense of sending out competent men to see what others are doing. We may give you as an instance the case of Messrs. —, whose turnover with us was very small until they decided to send out one of the partners of the firm. They are now doing many more thousands than they did hundreds.

With the growing financial consolidation of Egypt, and the gradual opening up of the Soudan, Egypt is a market which in my opinion ought to be cultivated without delay.

AUSTRALIAN NOTES.

FROM A SPECIAL CORRESPONDENT.

MELBOURNE, June 12, 1905.

THE stock taking month of June is with us again. It is generally anticipated that the balance sheets for the half year's trading will show fair results, without, however, being up to expectations.

The parcels post between America and Australia, due to make its appearance within the next few months, will prove a godsend to commercial men at both ends. Under the old system of "express agencies" small packages had a wonderful knack of never arriving at this end. So much so, indeed, that your correspondent, in common with others, has often stipulated that small packages from your side should be sent by parcels post via London, not by express agency.

Mineral oil wells are reported as existing in the Maitland district of New South Wales. An American expert is on the spot with drilling machines.

Hardware imports from and exports to Germany during 1904 furnish interesting figures. They are taken from trade statements issued by the Imperial German Government:

	Imports from Australia.	Exports to Australia.
Iron, Steel and Hardware.....	£150	£573,850
Brushware	50	23,250
Glass and Glassware.....		29,000
India Rubber, raw and manufactured....	1,150	22,800
Instruments, Tools, Machinery, Vehicles..	200	375,700
Earthenware		71,900

The above lines illustrate the fact that German competition is pretty healthy. In fairness to our German friends we must state that, according to their figures, their total imports from Australia (£6,001,050, wool and woollens amounting to £4,712,500) exceed their exports to Australia by £3,763,050. So they are good customers.

THE WILCOX MFG. COMPANY, Aurora, Ill., has increased its capacity in the overhead trolley track department by enlarging the plant and installing heavy machinery for the manufacture of all types of cranes. The company has placed at the head of its engineering department C. F. Blake, a member of the American Society of Mechanical Engineers, who has had many years' successful experience in designing and erecting cranes of all descriptions. The combination of modern cranes with its overhead trolley system, the company states, places it in a position to make bids on equipment to hoist and transport "anything, anywhere, any time."

KEYSTONE NAIL COMPANY.

THE KEYSTONE NAIL COMPANY, which was formed as a partnership in October, 1904, by H. J. Maroney and J. D. Seidell, and has been operating a plant in Philadelphia, Pa., for galvanizing nails, screws, tacks, washers, &c., by the Porter patent process, has recently incorporated under the same name with the following officers: H. J. Maroney, president; Geo. Porter, vice-president; George Breisch, secretary; J. D. Seidell, treasurer, and has purchased outright the Porter patents and machines, Mr. Porter, the inventor of these machines, becoming vice-president of the company. As owner of these patents the company refers to its advantageous position for producing properly galvanized nails, screws, &c. This work is all done with pure spelter, and by cooling the work with the Porter machines without submerging in water the articles galvanized do not become brittle and the coating will not peel off, while they are all evenly coated and perfectly separated, thus avoiding waste from rough finish or by the articles sticking together. The company is operating to its full capacity and intends in a very short time to install a thoroughly equipped plant in the Pittsburgh district, where the company will be closer to the base of supplies and in a better position to reach all sections of the country.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

THE VANDERMAN PLUMBING & HEATING COMPANY, Willimantic, Conn.: Catalogue of Plumbing and Heating Specialties. One of the principal specialties is Vanderman's patented Steel Tool Chests, which are made in six styles, four sizes of each style. Other goods shown are the company's patented Pipe Bending Forin, Steel Frame Portable Work Bench, Improved Smoke Test Machine, Vanderman's Four-Wheel Pipe Cutter, Lead Pipe Cutter, Elastic Lead Pipe Bender, Brass Pipe and Bench Vise, Combination Bench Pipe Vise, Radiator Union Valve or Union Elbow Connection, Adjustable Fittings, Soil Pipe Cleanout and Soil Pipe Test Connection, &c.

BEECH NOVELTY COMPANY, Mansfield, Ohio: Illustrated catalogue devoted to the Beech patent Mop Wringer, which is attached to a wooden pail.

GENERAL SPECIALTY COMPANY, Philadelphia, Pa.: Booklet illustrating its "Dorestop," "Dorechek" and "Cambolt" attachments for governing swinging doors.

W. G. CREAMER & Co., 96 John street, New York: Catalogue of Registers, Faces and Borders, Cast Iron Dampers, &c. Attention is also called to the fact that the firm will give estimates on Brass, Bronze or Iron Castings of any design.

WASHINGTON CUTLERY COMPANY, Milwaukee, Wis.: Attractive catalogue of Village Blacksmith Hand Made Butcher Knives and Tools, with illustrations in two colors showing steps in the process of manufacture. Reference is made to the fact that the company is asking and getting the co-operation of jobbers and retailers in maintaining prices on its product.

GILLETTE CLIPPING MACHINE COMPANY, 110-114 West Thirty-second street, New York: Catalogue of Clipping Machines, Cutters and Two Hand and Toilet Clippers.

INDIANAPOLIS DROP FORGING COMPANY, Indianapolis, Ind.: Catalogue of Drop Forged Wrenches, Combination Pliers, Cold Chisels, Punches, Machine Handles, Thumb Nut and Thumb Screw Blanks, Automobile Forgings and Ammonia Flanges, with illustrations of special Drop Forgings made by the company.

E. O. Furlong is successor to Furlong Bros. in the Shelf and Heavy Hardware, Stove, Implement, Paint and Sporting Goods business in Steamboat Springs, Col.

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Correspondence.

THE SYSTEM OF RESTRICTED SELLING PRICES.

To the Editor: In your report of the joint meeting of the Southern Hardware Jobbers' Association and the American Hardware Manufacturers' Association appears a very strong plea from one of the Southern jobbers for restricted selling prices. It is a frank, if not to say humiliating, confession on the part of this jobber that he, in common with some others, is unable to make a satisfactory profit; so he sends forth the "cry of Macedonia" to the manufacturers to "come over and help him." He asks to be protected against himself, so that the manufacturers in their wisdom may dry nurse him through the thorny paths of business and force him to make a profit on his goods in spite of the "bushwhacking tactics" of himself and some others.

It is not recorded what the manufacturers thought of this statement, though it would seem that if the manufacturer's principal customers fail in the very essential of business, that of making a living profit on the goods, that the manufacturer would naturally turn to other and more satisfactory channels of distribution.

JUST WHY MANUFACTURERS SHOULD BE RESPONSIBLE for the jobber making a profit is not made clear, but at the bottom of it all—so far as the manufacturers are concerned—lie two selfish reasons: First, every manufacturer wishes to interest the jobber by having the said jobber make a profit out of the goods of said manufacturer; therefore, as a second reason, if the jobber is content and is making a profit he is not so liable to be eternally pounding the manufacturer for a better price, and he constantly fails to get what is coming to him. One of the favorite schemes is to bill the goods to the jobber at the prices for which he should sell them and to hold back such profit as the manufacturer in his wisdom decrees the jobber should make until the end of a certain period. Then, upon the assurance of the jobber that restricted prices have been observed,

THE REBATE IS DOLED OUT TO HIM,

and the jobber seems absolutely oblivious of the fact that he has been kept out of the money to which he is really entitled all these weary months, that he has not gotten anything to which he is entitled by either the volume of his business or his enterprise, but that he has been merely put off with a pittance; so that so far as any real buying on his part is concerned he might as well discharge his buying staff and keep nothing but bookkeepers and accountants. Of course he sometimes needs an official who knows how to square himself "between the devil and the deep blue sea" by signing contracts with manufacturers as to making of restricted selling prices, and then making returns to the Secretary of the State in which he lives vowing that he has never under any conditions entered into any arrangement with anybody as to the maintenance of restricted selling prices and therefore that his conscience is quite clear as to any restraint of trade so far as his action is concerned.

THE REAL TROUBLE.

Now the real difficulty in all this business is that the blame has been put upon competition and conditions and not upon the real trouble, which is one nearer home. It is a simple fact of observation that locality, conditions, surroundings and the like are after all the smallest determining factors in the success or failure of any business; that the dominant note is the question of management, and upon this fact every business must stand or fall. One man makes money where another man fails under precisely similar conditions; yet the man who makes the failure is pretty sure to charge his lack of success to everything but the true trouble.

A SIMPLE LAW.

We have been educated to believe for a great number of years—ever since the time of Darwin—that there was a simple law known as "the survival of the fittest";

that it had always prevailed and always would. A good many efforts have been made to displace it by all sorts of artificial props and unnatural conditions, but generally the only result has been to make original matters worse. It is true enough that competition can be overdone and that excessive competition may be just as injurious as no competition at all; and yet no one—not even the so-called trusts—has ever been able to do away with competition altogether. We have finally settled down to the fact of making the most of it and of attempting to regulate it in a reasonable way instead of superseding it entirely.

LOCALIZING BUSINESS.

It seems a simple proposition if a man cannot by his own unaided efforts make money in his business that he should naturally take the consequences. Just why he should depend upon others to help him is not apparent. The natural result of any system of restricted selling prices is to localize business—to produce a host of small jobbers all throughout the country. A further result is to build a Chinese wall around the business of the retailer, to cut him off from every source of supply save that in his immediate neighborhood, to throttle brains, ability, enterprise and intelligence, in order that the incompetent and the plodders may share equally well with those who are up to date and enterprising.

WHERE DOES THE RETAILER COME IN?

It is a well recognized fact that a large business can be done on a less percentage of cost than a small one, and it is certainly to the large house that they (the retailers) must turn in their effort to meet catalogue house competition. The retailer will naturally find his source of supply seriously diminished. And it is rather interesting to note that no one yet has been able to find any good reason why restricted selling prices on the part of the jobber should be a good thing for the retail trade. Again, so far as the retail trade is concerned, it puts them all on the same level, and the up to date retailer has no advantage over his neighbor across the street who belongs to a past generation. It is the business of the retailer to buy his goods as cheaply as he can, quality considered, and if he is to be "held up" by an ironclad wall of prices over which he has no control it is difficult to see just where he comes in.

CAN THE MANUFACTURER DO IT?

One of the most curious delusions of the whole plan is that it is taken for granted that the manufacturer can remedy the evil of unrestricted and unwise competition and that he can do so only by forcing the jobber to sell at certain figures. Now is it not asking too much of human nature, even of that nature of the high degree of intelligence and integrity represented by the average Hardware jobber, that it should live up to these arrangements under all conditions and under all circumstances? Is any one—outside of banqueting hours—so guileless as to believe that an association of 200 men—even good, picked, tried men—is going to maintain certain prices without any deviation? What has been the experience of the past? Take the manufacturers themselves—their numbers are much smaller—they are supposed to have a wider view and somewhat more extended experience in many ways than jobbers, particularly as to understandings regarding prices. Now it is a cold fact that they have tried gentlemen's agreements, understandings, pools and all sorts of arrangements, and usually with the same result. They have found that even when a few of them were gathered together in the name of profit that some fellow was pretty sure to go out and cut the price, and sooner or later the understanding came to an end, because the fellow who cut the price got the business and the other fellow got tired of holding the bag.

PREMIUM ON DISHONESTY.

Then, again, let us be entirely frank in this matter and admit that there are some, even among the jobbers, who welcome this sort of an arrangement, because it gives them an opportunity of getting in their work at the expense of some of their more observant brethren. Are we not all acquainted with those enterprising houses which have made a very "good thing" by quietly cutting

restricted selling prices? Have they not arranged it so that their salesmen "walk in water," leaving no trail behind them, so that it is impossible to "tree" them and bring them to account? Is that the kind of an education that a salesman should have? Have we any right to place that kind of temptation in his way? What is the natural result? Those who maintain the prices honestly and without deviation merely suffer at the hands of those who do not, and thus a premium is placed on devious ways and underhand methods.

Nor must we lose sight of the fact that there will always be a number of jobbers who fail to control their salesmen properly, who have no system of restraint or discipline, although the best of intentions prevail in the home office. Such jobbers might indeed make a good thing out of restricted prices—or, rather, out of the not keeping of them—replying to questions from manufacturers as to why they have cut prices by explaining that it was done by their men and without their knowledge or consent.

An illustration of the use to which restricted prices might be put would be in connection with a profit sharing system in accordance with which at the end of the year a check for alleged profits is sent by the jobber to his customer, which obviously might cover concessions which are merely cuts in price which it is not desirable to make openly.

IT IS NOTEWORTHY AS A MATTER OF EXPERIENCE

that conservative houses and those who are most strongly opposed to this plan have at the same time been working more in harmony with the manufacturers and have done more to prevent demoralization than those who have signed agreements readily and broken them quite as quickly. The principal condemnation in the New Testament was visited not on the man who said he would not and yet did, but on the man who said he would and did not.

It seems to be entirely overlooked that the goods sold under restricted selling prices are but a small proportion—either in tonnage or in value—of those which are sold on the "open shop" principle. It follows, therefore, that the jobbers somehow manage to make money on the great amount of goods which they sell without any restricted selling prices. As a matter of fact, it will be found upon examination that they make upon the whole a more satisfactory profit on these goods than on those items on which their hands are tied.

WOULD BREED BAD FEELING.

It is noteworthy that there are quite a number of jobbers in different parts of the country who have managed to establish a reputation for making money, and yet they are subject to the same competition, sell goods under the same conditions and have exactly the same trials to contend with as do those jobbing houses which have been forced to make the humiliating plea that they have been unable to conduct their business so as to make a living profit. Is it not time for a little self examination on the part of each jobber as to his ways and means of doing business? Should it not occur to some of them that if they cannot make money for themselves no one can arrange any scheme by which the impossible can be accomplished? It is admitted by even the most interested and strongest advocates of the restricted price system that it is only successful in part and that there is no such thing as a rigid observance of it. This again always means that the man who observes it suffers at the hands of the man who does not. It does not really make a great deal of difference, so far as principle is concerned, if it is observed to a certain extent, for the fact remains that it is absolutely unjust that any plan of this kind should prevail where one man suffers because of his keeping his word and another man profits because he fails to do so. Few things could breed more bad feeling among the jobbers, because it forces them to make accusations one against the other, it means recriminations and countercharges, it puts one jobber in the attitude of accusing another jobber of bad faith, stirs up ill will, for practically the manufacturer under these conditions relies upon one jobber to give him proof as to the price having been cut by another. Proof is often difficult to obtain—sometimes impossible—although the fact of such cutting is really well known and

understood by the salesman. The manufacturer is forced into a very embarrassing position as to what he will decide—whether he shall visit the penalty upon the alleged defendant when evidence, while tending to convict, is not of a nature yet definite enough. It generally happens that he is pretty sure to lean to the side of mercy, and the same thing goes on over and over again until the cutter of prices becomes absolutely indifferent and careless and is the one most of all interested in upholding the appearance of the system.

DISADVANTAGEOUS TO RETAIL BUYERS.

The absurdities of the plan in some respects really seem past belief if they were not painfully true. For instance, some items are sold at the same price in San Francisco as in New York City. Natural distances and conditions are thus arbitrarily set aside, so that some one is bound to be hurt; either the man in New York is paying a great deal too much or else the man in San Francisco is getting his goods entirely too cheap; one section profits at the expense of another. The retail buyer has no show; every one is treated alike and on the same dead level of uniformity. He has no chance of making money by his own ingenuity, skill or brains; he simply buys at the price that he is told to pay by the manufacturer to the jobber.

NATURE'S PENALTY.

It is not surprising, therefore, that under these conditions the retailer naturally seeks other goods and encourages that very competition that these restricted selling prices are supposed to prevent. It is one of the well-known facts of business that the surest way to kill profits is to have a uniform system of prices prevailing all over the country. Sooner or later the selling prices on these goods will drift down to a point where the goods themselves no longer interest any one. If you prevent nature taking her course in a natural way she is pretty sure to come back with a penalty. Even where the effort is made to equalize prices in different parts of the country according to the distance from the factory it is impossible to do so uniformly and advantageously. Freight rates are too complicated for any system of this kind to work fairly to all dealers.

The whole system in itself is unnatural, artificial, and must consequently bring its own reward. It is the resort of those who frankly admit that they are unable to take care of themselves; it is the handicap placed upon intelligence, enterprise and progress, and it cannot possibly stand any fair and unprejudiced discussion in its present shape, particularly if it be made apparent to the retailer that nothing is more directly against his interests than this same system.

HOSTILITY OF THE PUBLIC.

There is to-day a very strong popular undercurrent against any undue maintenance of prices and against anything that interferes with natural competition, and this is at the bottom of the feeling against the so-called trusts, and only those who will not see fail to recognize the fact that this feeling is running very deep and strong at present. It is unwise ever to disregard popular impressions, particularly in a democratic country like our own, and those who fail to recognize the signs of the times are merely storing up for themselves trouble in the future.

A. W. DOUGLAS, Vice-President,
SIMMONS HARDWARE COMPANY.

BINDLEY HARDWARE COMPANY'S DINNER.

THE BINDLEY HARDWARE COMPANY, Pittsburgh, Pa., gave a dinner at the Hotel Duquesne in that city on July 7 to about 25 of its traveling men. John Bindley, president of the company, was toastmaster, and addresses were made by Mr. Bindley, James W. Wardrop, secretary and manager of the Merchants' and Manufacturers' Association; W. H. Cochrane, treasurer of the company; E. J. Lloyd, secretary; John Reitz, Jr., manager of the Amberson avenue warehouse; William J. Mercer, sales manager, and by a number of department heads and salesmen. A dinner is given annually by the company to its traveling representatives.

Wood Shovel & Tool Company's Plant at Piqua, Ohio.

CONCLUDING ARTICLE.

MAKING A SHOVEL.

In this connection a brief description of some of the processes employed by the company in manufacturing Shovels may be of interest. Steel for plain back Shovels, Spades, Scoops, &c., is ordered in widths and multiples, to suit the different type of tool desired. The multiples



Fig. 8.—Glue or Wheel Room.

come in sheets from the rolling mill, varying in length from 5 to 8 feet long. These sheets are first taken to the trimming press and cut into Shovel lengths. From the trimming press they go to the first furnace, where the ends are heated for scarfing. They are scarfed on a Justice hammer, and then pass to the second furnace and are heated to a welding heat in connection with the back strap, and with a Justice hammer the back strap is welded to the blade. Two operations are required for the back strap and four for the front strap to prepare them for the Shovel blade. They are examined for miswelds before going to the next furnace. The blade with

the various sizes and shapes made by the factory. They next pass to a small press where the two upper rivet holes are punched in the front and back straps.

The next point of interest is the forming or drop hammer. The blade of the shovel is placed in the furnace again and brought to a cheery heat and put under this hammer, which contains the forming die for whatever kind of shovel is wanted, a 600-pound drop forming it into proper shape.

It then passes to the press for punching the lower holes in the straps and then to the last heating furnace. Here the strap end of the shovel is placed in the furnace and, when heated, is put into a forming press that forms the socket and shapes or gives the lift that is peculiar to this make of Shovel.

This is the last time the blade or any part of it is heated and also completes the forming and shaping of the tool. The dead stroke hammer then removes any inequalities in the blade, and it is passed to an emery grinder, who grinds the edges, sharpens the point, and inspects each part again before passing it to the next department.

The blades are then taken to the pickling room and placed in tanks or troughs for an acid bath to remove scale or any foreign matter and prepare them for the polishers.

The polishing department is made a leading feature by the company. The unusually high mirrorlike polish given the goods makes them especially attractive. After polishing, each man's work is critically examined and, if passed, it goes to the oiling bench, where it is oiled to protect the blade while passing through the handling room. The numbers, kind of steel and the names of certain grades are then stamped on the steel strap, completing the blades ready for the handle.

Six Operations Are Necessary

to prepare the handle for the blade. The handles are placed in steam tubs and the lower part steamed for bending, then forced into forms made for the style of bend desired, and placed in a dry kiln to evaporate the moisture or water taken up in steaming. When dry the forms are knocked off and the handles taken to the



Fig. 9.—Room for Finishing, Labeling and Tying.

the back strap attached is again placed in the third furnace, and, in connection with the front strap, is brought to a white or welding heat and then placed under a Yeakley vacuum air hammer and the front strap so thoroughly welded as to have the appearance of a solid piece Shovel.

While Still Hot

the part is put under a fast revolving wire brush to remove scale. After each welding process a small number is stamped on the upper corner of the blade to fix the responsibility of each man's work in the welding. The next operation, and while still hot, is to put it under a heavy drop hammer and flatten the blade, when it passes to the lap grinder, who grinds down any unevenness on the lap or weld. When taken from the table and placed upon trucks the pieces are thoroughly tested upon an anvil to insure perfect welds, and then go to a heavy trimming press, where each is blanked out into

boring machine, where the holes for the D-handle rivets are made. They are then riveted, after which they are heel chopped and are ready for the sticker. The blade and handle meet at the sticker's bench, where the handle is driven on, and then turned over to another boring machine for boring the rivet holes through the wood, or strap part. The rivets are next driven through the strap and the shovel passes to the riveting machine.

The next process is that of the breaking down rolls, which neatly lay the strap down into the wood, completing the forming or building of a Shovel. The most rigid inspection as to alignment, hang and workmanship then follows that they may be perfectly balanced and insure satisfaction to the user.

The finishing up of the strap and handle come next. An emery wheel grinds off and smooths up the edges of the straps and rivet points. Next comes the roughing of the strap on an emery buffing wheel, followed with

the smoothing up and polishing of the strap on emery belts coated with fine emery, which completes the work on the steel parts.

The next operation is smoothing the wood or handle part on endless belts coated with flint, after which the Shovels are ready for the finishing or labeling room. The trucks are taken to the labeling room, where the blades and straps are carefully cleaned off and dipped into a lacquer to preserve them from rusting. After dipping they are placed upon steel drying racks, where they are also labeled upon the D and strap with neat and attractive labels, after which they are given their final inspection. This inspection takes in every part of the work and if found perfect the product is tied into bundles of half a dozen each and taken on trucks to the shipping rooms, ready for the market.

From the time the raw material begins at the south end of the factory and ends at the shipping room, at

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM LEONARD BROS., who have succeeded A. B. Duncan in the Shelf Hardware, Implement and Paint and Oil business at Potomac, Ill.

FROM THE BRANDON HARDWARE COMPANY, Brandon, Manitoba, which has increased its capital from \$30,000 to \$60,000. The company's business is both wholesale and retail and covers, among other lines, Shelf and Heavy



Fig. 10.—Storage and Shipping Department.

the north end, as a complete and perfect Shovel, ready for the market, it has passed through some 50 operations.

RUWE BROS.' NEW BUILDING.

RUWE BROS., Brooklyn, N. Y., have just moved into a new and modernly constructed warehouse and office building, which they have erected at 765, 767 and 769 Atlantic avenue. The firm jobs Blacksmiths' Supplies, Truck and Wagon Wood Stock, Iron and Steel, Hardware, Hard Wood Lumber and is about adding Contractors' Supplies, including Shovels, Picks, Crowbars, Wheelbarrows, &c. The building is opposite their old stand, which they occupied for 14 years, or since they began business. The new building is near the Flatbush avenue station of the Brooklyn Subway, which will be connected with New York by the East River tunnel. The building, 60 x 100 feet, has a front of buff brick and is four stories high, the ceiling of the first floor being 13 feet and the other three stories each 11 feet high. It is equipped with electric elevator and electric lights. A portion of the first floor, at the front, is fitted up as offices, finished in North Carolina pine, with lavatory, &c., adjoining. The offices have been newly furnished with desks, file cases, &c. The doorway to the first floor is wide enough to admit a truck, and the floor is of Portland cement. On this floor is kept Iron, Steel, Horseshoes and Nails, &c. The other floors are devoted to Wheels, Wood Stock and Blacksmiths' Supplies. With the more commodious quarters thus furnished the firm is in much better position than heretofore to take care of its constantly increasing business.

THE business of J. H. Sessions & Son, Bristol, Conn., which has been carried on for many years as a partnership, was taken over on July 1 by the corporation J. H. Sessions & Son. There will be no change in the management. Alfred L. Sessions is president of the company.

Hardware, Stoves, Paints, Sporting Goods, Blacksmiths' Supplies, &c.

FROM THE BARKLEY, BOUTON & CRAIN HARDWARE COMPANY, Fort Collins, Col., which has bought out the J. A. Brown Hardware Company and will continue the sale of Shelf and Heavy Hardware, Stoves, Tinware and Sporting Goods.

FROM THE LANCASTER HARDWARE COMPANY, Lancaster, N. Y., successor to Jonathan Heller. Wm. L. Heller will act as manager for the new firm, and several new lines will be handled.

FROM RICKER MFG. COMPANY, Rochester, N. Y., which from manufacturing Hay Carriers and Refrigerators has started wrought iron works, also the making of Brass and Copper Specialties, and would be pleased to receive catalogues of interest in this connection.

FROM H. A. LE ROY COMPANY, INCORPORATED, Alexandria and Osakis, Minn., handling Shelf Hardware, Stoves and Tinware, Agricultural Implements, Paints and Oils, Sporting Goods, Harness, &c.

FROM ROSS, DYE & COWGILL, Central City, Neb., successors to Ross Bros. in the Shelf and Heavy Hardware, Stove, Paint and plumbing business.

FROM THE BIG STORE COMPANY, INCORPORATED, Ellensburg, Wash., G. R. Bradshaw, manager, which has succeeded to the Hardware and furniture business of Bradshaw & Cooper and made considerable improvements in the store.

THE ISTHMIAN CANAL COMMISSION has been requested to purchase for use on the Isthmus of Panama 2000 spring rat traps and 500 wire cage traps.

AMONG THE HARDWARE TRADE.

The Kiefer-Haessler Hardware Company of Milwaukee, Wis., has recently increased its storerooms and will make a specialty, in addition to its regular lines, of Builders' Hardware. With a view to accommodating the trade the firm has provided a special showroom, fitted out with tables and easy chairs, with samples of Builders' Hardware properly displayed. Mr. Haessler, who has recently identified himself with this business, was for fifteen years with the Philip Gross Hardware Company of the same city.

North & Co., formerly of Bayard, Neb., have moved their stock to the town of Minature, in that State, where they will continue to retail Shelf and Heavy Hardware, Implements, Paints, Stoves and Sporting Goods.

Dean & Cripps have opened a new Hardware and House Furnishing Goods store at 314 Malvern avenue, Hot Springs, Ark.

The store of H. K. Johnston Hardware Company, Alton, Ill., has been completely gutted by fire. Estimated loss, \$40,000; insurance, \$46,000. The firm is occupying temporary quarters while rebuilding and adding another story to the damaged structure.

The furniture and Hardware business of C. C. Schuchord of Menardville, Texas, has been bought by F. Luckenbach and C. H. Blakney, who will continue it in connection with a stock of general merchandise under the firm name of C. H. Blakney & Co.

John S. Crusier, formerly with W. C. Heller & Co., Montclair, N. J., has established himself in the Hardware, Paint and House Furnishing business at 110 Roseville avenue, Newark, N. J.

Duncan Bros. & Cave have succeeded W. E. Duncan in the Hardware and general merchandise business at Hylton, Texas.

S. C. Wright, Santa Ana, Cal., has sold his interest in the firm of Wright & Kendall to Henry Franzer, Jr. This retail business in Shelf Hardware, Stoves, Paints, &c., will in the future be conducted under the style of the Santa Ana Hardware Company.

The business of Ludemann & Miller, handlers of Shelf and Heavy Hardware, Stoves and Sporting Goods, at Parksburg, Iowa, has been purchased by the Beck Hardware Company.

Thomas Thompson has bought the Hardware stock of Carlberg Bros., Sisseton, S. D., and will continue the business, adding a line of Brass Fittings, Threshing Machine Supplies, Pumps and Fittings.

George Smith, who operates Hardware stores in Gardner and South Wilmington, Ill., has recently suffered the loss of the latter store by fire.

The John Smith Company, Agricultural Implements, Harness, Vehicles, &c., Walla Walla, Wash., was burned out recently, losing about \$15,000 above insurance. The next day it was doing business in a tent pitched near the old location, which will be occupied until rebuilding is completed.

The Speer Hardware Company, Fort Smith, Ark., wholesale Shelf and Heavy Hardware, House Furnishing Goods, Machinery, Vehicles, &c., has increased its capital stock from \$60,000 to \$300,000.

W. E. Harris has recently opened a Hardware store in Ottawa, Kan.

R. S. Olcott & Son, retail merchants in Shelf and Heavy Hardware, Stoves, Paints, &c., Perry, Mich., have been brought out by C. C. Austin.

Whitlock & Demieville have succeeded Whitlock, Hanna & Demieville, at Maramec, Okla.

The wholesale and retail business of the Stroud Hardware Company, Stroud, Okla., has been sold to H. H. Burling.

The store of the Lemmer Hardware Company, Argenta, Ark., has been destroyed by fire.

MISCELLANEOUS NOTES.

Canadian Solid Neck Shovel.

The Canadian Shovel & Tool Company, Hamilton, Ontario, represented directly by J. C. McCarty & Co., 10 Warren street, New York, whose incorporation and new plant were referred to in these columns last week, will soon begin the production of a solid neck socket shovel by a patent process, the exclusive rights for which have been secured by this company. This shovel resembles in outward appearance the Maynard solid neck shovel, although its production is accomplished by an entirely different process. The shovel is made from one piece of bar steel without any welding or splitting, having a solid neck and straight socket for handle. Its chief advantages are that it gets away from any deep depression, thus insuring a clean face, as opposed to the raised surfaces on many types of shovels, which tend to hold dirt, clog the tool and develop rust. The process of manufacturing this shovel requires it to be rolled out individually on specially constructed rolls. A thick center can thus be made on the plate, an important advantage, as the wear and strain of a shovel are on the center line of the blade. A further advantage of this shovel is in having a straight socket in which the handle is inserted. In case of need the handle can easily be replaced by an ordinary mechanic in a short time. Such handles, ready chucked for the purpose, may be had from the company at any time. The shovels are made from high carbon steel and are oil tempered. The shovel, being constructed of a high carbon steel, will only be listed in first grade and will be labeled "Bulldog." The company expects to be ready to supply these shovels, along with the ordinary grades of hollow back and back strap goods, about September 1 next.

Fire Proof Boxes.

Vanderman Plumbing & Heating Company, Willimantic, Conn., has recently added to its products a line of sheet steel asbestos lined fire proof boxes, or portable safes, which are constructed of sheet steel and asbestos mill board, this construction, it is claimed, making a fire and burglar proof box for holding valuable papers, drawings, models, tools, &c. The standard sizes are numbered from 1 to 10, inclusive, and the dimensions run from 6 inches deep, 8 inches wide and 12 inches long up to 24 inches deep, 26 inches wide and 42 inches long. Any other special size or shape will be made to order. Each box is furnished with a Yale lock and two keys.

Cast Steel Hammers.

David Maydole Hammer Company, Norwich, N. Y., and 155 Chambers street, New York, has greatly increased its large line of high grade cast steel hammers. The company is now making ball pein hammers in 13 sizes, from 1 ounce to 3 pounds, in half polished, full polished and polished and nicked, with round face. This hammer is also made with octagon face, same sizes, in both half polished and nicked. The cross pein style is made in 12 sizes, 2 ounces to 3 pounds, in both round and octagon face, all half polished. Another innovation is in octagon brad hammers in 2, 3 and 4 ounces, straight claw, full polished. A similar line is made, except that nails are drawn with a drop claw instead of straight claw. There is also now available an extended line of bell face adze eye nail hammers in 5-ounce weights. The styles in this size are drop claw, half polished, and drop claw, nicked, with varnished hickory handles; also with

a handsome black enameled handle. This style of hammer with straight claw is made in half polished and nicked, varnished hickory handles, and the same hammer nicked with black enameled handle. The weights named above do not include handle. Artisans in the finer metals, such as workers in gold, silver, &c., use many of the small hammers.

The King Auger Bit.

The Spell Mfg. Company, Fiskdale, Mass., has within the past few months developed and perfected a single twist auger bit having a head formation like that of the company's Jennings pattern bits—i. e., extension lips and double spur. This King bit, as it is called, was designed by the company for the purpose of catering to the increasing demand for a bit of the "single twist" pattern having the double head, and is referred to as a very attractive tool, possessing all the virtues of the regular single cutter bit as regards stiffness, greater clearance for chips, &c. Being equipped with a fairly coarse screw the bit works rapidly, cutting a smooth hole in all woods that permit of the use of a spur bit. The King bits are highly polished and put up in boxes containing one-half dozen.

Combination Plier.

The Utica Drop Forge & Tool Company, Utica, N. Y., the product of which is marketed by the Smith & Hemenway Company, 296 Broadway, New York, has just per-



Combination Flat Nose, Gas Pipe, Side Cutting and Button Plier.

fecting the combination flat nose plier No. 700, here illustrated. This tool, although taking the same number as one formerly manufactured by this company, has various new features and is made with entirely new dies. The contour of the handles has been appreciably modified to fit the palm without tiring the hand and yet allow for cutting wires in the notches up to No. 9 gauge. Larger wire can be cut between the side cutting jaws while leaving the handles close enough together to enable the user to exert the greatest pressure at maximum leverage. The present style of the joint allows an opening between the side cutting jaws (see smaller cut) much larger than the combination plier superseded, thus giving a capacity for very large wire, especially when being used on heavy insulated material. The oval or buckshot throat lends itself readily to this wide opening, giving a large throat, while maintaining the great strength needed, it is said, this recent change permitting the cutting of a 50-wire cable with the surrounding insulation. Other characteristics are the gas pipe or burner grip for turning burrs or nuts, small gas pipe and burner tips, or holding pieces of round or other shaped wires; V cut in the nose, which is a convenience to telephone linemen in stretching wire in the installation of new systems, holding nails, brad awls, &c., in reaming small holes, and the screw driver and reamer on ends of handles, with rounded corner handles to save wear of clothing. On two sides of the joint are Button wire cutters of different capacities.

Asbestos Roofing Slates, Shingles and Sheathings.

A new form of roofing and building material is now being manufactured by the Asbestos Shingle, Slate and Sheathing Company, Ambler, Pa., whose sole selling agent is the Keasbey & Mattison Company, also of Ambler, with branches in a dozen of the largest cities in the United States, one of which is at 104 John street, New York. This product is made under L. Hatschek's patent, and is known abroad as Hatscheks-Eternit-Schiefer, being manufactured at Budapest, Hungary, the main office

being at Vocklabruck, Austria, near Vienna. In the United States the material is called Asbestos Century shingles. Some of the important characteristics of this commodity are that it is absolutely fire proof and that it is not affected by continuous moisture, frost or subject to deterioration by the elements in any way. The shingle is made of mineral fiber asbestos and hydraulic or Portland cement, and its insulating quality for electrical resistance is very high. It is unaffected by extremes of heat or cold and will not disintegrate or exfoliate under such conditions. Neither will it burst or fly to pieces when a stream of cold water is played upon it while red hot. In the process of manufacture a medium grade of asbestos fiber is mixed with Portland cement, which forms a pulp, and is then passed over paper making machinery in practically the same way as paper is made. The shingle can be made in any size, shape, thickness or color. Some now made are in several shades of gray, from the natural asbestos color to darker tints and also terra cotta, the shades of color being obtained by the admixture of pigment as paint is made, the trade names of which are Newport Grey, Natural Slate, Indian Red and Spanish Brown. The shingles are not brittle and electricians, linemen and others can walk on them with impunity, while nails can be driven through them without fear of breakage. They are said to cost less than slate and there is no loss from breakage in installation or shipment. The same company also makes what is called asbestos building lumber, which differs only in size and shape, being made into sheets or boards to meet the specifications

of architects, engineers, builders, contractors, &c. This material, instead of deteriorating with age as a result of exposure to the elements, from its very nature becomes, it is said by the manufacturer, with the lapse of years impermeable when exposed to atmospheric conditions, as is proven by the known condition of old Greek and Roman remnants of antiquity that are composed largely of hydraulic cement, while asbestos fiber has remained exposed to the elements for ages. The lumber, whether in the form of shingles or larger size, has sufficient elasticity to permit of it being bent around curves without splitting, and it can be punched, filed or worked generally with ease with ordinary machinery such as is used for working iron.

Malin's Stove Pipe Wire in Coils.

The Malin & Co., Cleveland, Ohio, manufacturer of wires, is offering merchants something new in the shape of Stove Pipe Wire done up in neat coils, as illustrated herewith. When a stove or a piece of pipe is sold there is often a call for such wire, which, if cut out of a



Malin's Coiled Stove Pipe Wire.

large bundle, would usually be thrown in. It would seem to be somewhat more convenient as well as more profitable to sell one of these coils, which can be retailed at 5 cents. Nos. 18, 19 and 20 Stove Pipe Wire is put up in 50-foot coils, one dozen coils to the box and 50 boxes in a case.

Improved Folding Pump.

The folding pump illustrated herewith is made from No. 18 gauge seamless brass drawn tubing finished in nickel plate or polished brass. It has a malleable hinged stirrup, with a snap spring to hold it in place when folded. The plunger rod is fitted with a hollow

a variety of sizes of angle and base, the standard size having a base 30 inches long, the base tapering from 4 x 5 inches at the bottom to 4 x 4 inches at the ground level. The post proper is a punched angle made of high carbon steel of a sufficient length to give 52, 60 or 66 inches above the base or ground level. This post is ordinarily made of 1¼ x 1¼ x 5-32 inch high carbon steel



Improved Folding Pump.

cast handle, with lock nut or rod to hold it horizontally rigid while in use, and there is a thread on the cap sleeve to lock the rod and handle perpendicularly when not in use and prevent the rod from backing out owing to the jar of the vehicle. The rubber tubing can be secured with the angle tire nipple to a boss on the side of the pump, thus keeping the tubing from buckling or flopping around. The maker, the Gleason-Peters Air Pump Company, 20 West Houston street, New York, calls especial attention to the new movable plunger and in-take valve, which is claimed to be absolutely dust proof.

Machine for Making Steel-Concrete Fence Posts.

The Indestructible Post Company, First National Bank Building, Chicago, has added to its line a post making machine, which it offers to the trade in connection with its business in the manufacture and sale of posts. Freight charges on posts with cement base are so heavy as to make it difficult for the company to secure and maintain business with consumers or dealers at any great distance from Chicago. This objection is overcome by the sale of post making machines, which permit the buyer of the machine to buy his punched steel angles from the company and to form the concrete base to the posts near the place of consumption. As will be seen by the illustration, the machine consists of a box with movable sides and ends, the movement of the sides and ends being accomplished by means of a lever at the rear of the machine, which actuates a cam mechanism. The front gate of the machine, an iron casting, is perforated with an angle shaped opening, through which the operator inserts the punched angle which is to form the fence post. The lower portion of the gate is cut away sufficiently to admit of the insertion of what the manufacturer terms a pallet, which consists of a flat cast plate having the dimensions of the side of the concrete portion of the post to be made. To one end of this plate is attached an angle bar saddle, which extends out beyond the machine. When the pallet is inserted in the box the rear end gate is closed and concrete is tamped into place by hand in the bed of the box up to about half the thickness of the base; the punched steel angle which is to form the body of the post is inserted through the perforation in the front end gate, the saddle on the end of the pallet in connection with the angle opening holding it in alignment. More concrete is then dumped into the box and tamping is continued until the box is full. To remove the finished post the lever is given a turn over about 90 degrees, throwing the sides and end of the box open and permitting the operator to lift out the completed post superimposed on the pallet. The pallet and post are then laid aside, where the post is permitted to dry for several hours before removing it from the pallet. One hundred pallets for line posts and eight pallets for end, corner and hitching posts are furnished with each outfit. The line post itself is made in

angle, punched suitably for any kind of fencing. End, corner, gate, hitching and other special posts have a concrete base 44 inches long, 6 x 6 at top and 6 x 9 inches at bottom, the length and thickness of angle or gas pipe being varied to suit requirements. Claim is made by the company that in almost every part of the country these steel and concrete posts can be manufactured by means



Machine for Making Steel-Concrete Fence Posts.

of this machine at a slightly less cost than cedar posts, and that while the life of cedar posts ranges from 5 to 10 years the angle steel and concrete post is practically indestructible.

JAMES T. McCABE, president of the McCabe Hanger Mfg. Company, was a passenger on the Oceanic, sailing from New York last week. His itinerary includes England, Scotland, Ireland, Norway, Sweden, Denmark, Holland, Belgium and France. Through its Birmingham representatives the company already enjoys a good trade from these countries, as an example of which it may be cited that 300 sets of No. 2 Hangers have been exported to Stockholm within the last three weeks. Mr. McCabe's trip is expected to lead to still larger business relations.

The Knox Holdback Fastener.

The Northern Novelty Company, Utica, N. Y., has gotten out a new device for fastening the holdback strap to the shafts or thills of single wagons and carriages, as shown in the illustrations herewith. It is made of malleable iron, nicked and polished, and the base plate is

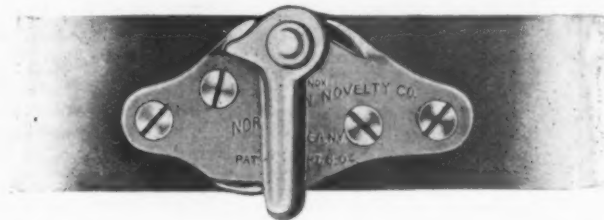


Fig. 1.—The Knox Holdback Fastener.

attached to the under side of the shaft with four screws, tinned to prevent rusting, as shown in Fig. 1. The strap bar is hinged to the base plate by a rivet and on the opposite side is held securely in place against a lug by a strong spring made of imported German silver music wire. The ordinary holdback strap is used and after it is adjusted and buckled no further attention is required. When harnessing it is only necessary to press the strap bar forward and slip in the loop of the holdback. When



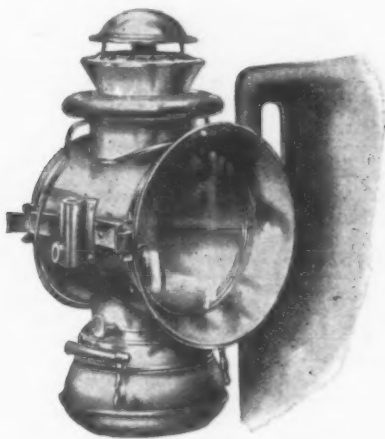
Fig. 2.—Strap Automatically Released.

unharnessing the strap is automatically released, Fig. 2, by the forward pull of the horse walking out of the shafts. The advantages claimed for this fastener are that it admits of the holdback being kept buckled at the proper adjustment, thus facilitating harnessing, and in un-

harnessing it requires no attention whatever. It is made in two sizes, for 1 and 1½ inch straps.

Ham's Diamond Driving Lamp.

C. T. Ham Mfg. Company, Rochester, N. Y., is putting on the market the driving lamp shown in the accompanying illustration. The lamp is built on the same lines as the company's cold blast runabout lamp and on its cold blast principle. The interior of the lamp is highly finished with silver nickel, the back reflector is heavily silver plated, and the lens in the door is double convex, finely ground and polished to greatly magnify the light. There is a back door for cleaning the back



Ham's Diamond Driving Lamp.

reflector, and this, with the simple and efficient locking device on the oil pot, is referred to as making all parts easy of access for cleaning purposes. The lamp is strongly constructed, can be attached either to the right or left side of the dash and is furnished in four styles—steel, enameled black or nickel plated, and brass, polished or nickel plated. Among other features the following are mentioned: That the lamp furnishes the maximum of light, that it is wind proof and does not smoke, that it will not jar out and that it is handsome and neat in appearance and suitable for the finest carriage.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

Lead, English white, in Oil.....	9½@9%
Lead, American white, in Oil.....	9½@9%
Lots of 500 lb or over.....	@ 6½
Lots less than 500 lb.....	@ 7
In Barrels.....	@ 6
Lead, White, in oil, 25 lb tin	
pairs, add to keg price.....	@ ½
Lead, White, in oil, 12½ lb tin	
pairs, add to keg price.....	@ 7
Lead, White, in oil, 1 to 5 lb	
assorted tins, add to keg price.....	@ 1½
Lead, American, Terms: For lots 12	
tons and over ¼¢ rebate; and 2% for	
cash if paid in 15 days from date of	
invoice; for lots of 500 lbs. and over	
2% for cash if paid in 15 days from	
date of invoice, for lots of less than	
500 lbs. net.....	9½@9%
Lead, White, Dry in bbls.....	@ 6
Zinc, American, dry.....	4½@4%
Zinc, French.....	4½@4%
Paris, Red Seal, dry.....	3½
Paris, Green Seal, dry.....	3½
Antwerp, Red Seal, dry.....	3½
Antwerp, Green Seal, dry.....	3½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	11½@12½
Lots of less than 1 ton.....	11½@12½
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over.....	10½@10%
Lots of less than 1 ton.....	10½@11%
Discounts—French Zinc.—Discounts	
to buyers of 10 bbl. lots of one or mixed	
grades. 1% 25 bbls. 2% 50 bbls. 4%.	

Dry Colors—

Black, Carbon.....	5 @10
Black, Drop, Amer.....	4 @6
Black, Drop, Eng.....	5 @15
Black, Ivory.....	16 @20
Lamp, Com.....	4½@6
Blue, Celestial.....	4 @32
Blue, Chinese.....	25 @32
Blue, Prussian.....	27 @30
Blue, Ultramarine.....	4½@15
Brown, Spanish.....	4½@6
Carmine, No. 40.....	\$3.50@3.60
Green, Chrome, ordinary.....	3½@6

Green, Chrome, pure.....	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over.....	@ 6½
Lots less than 500 lb.....	@ 7
Litharge, American, bbls.....	6 @8
Ocher, American, Golden.....	2½@3
Ocher, French.....	1¼@2½
Ocher, Foreign Golden.....	3 @4
Orange Mineral, English.....	8 @10
Orange Mineral, French.....	10½@11½
Orange Mineral, German.....	7½@10
Orange Mineral, American.....	8 @8½
Red, Indian, English.....	4½@8
Red, Indian, American.....	5 @3½
Red, Turkey, English.....	4 @10
Red, Tuscan, English.....	7 @10
Red, Venetian, Amer.....	100 lb \$1.50@1.25
Red, Venetian, English.....	100 lb \$1.15@1.75
Sienna, Italian, Burnt and	
Powdered.....	3 @9½
Sienna, Ital. Raw Powd.....	3 @6½
Sienna, American, Raw.....	1¼@2
Sienna, American, Burnt and	
Powdered.....	1¼@2
Talc, French.....	9 ton \$15.00@30
Talc, American.....	9 ton \$15.00@25.00
Terra Alba, French.....	100 lb 90 @1.00
Terra Alba, English.....	100 lb 90 @1.00
Terra Alba, American.....	100 lb
b. No. 1.....	60 @70
Terra Alba, American.....	100 lb
b. No. 2.....	45 @50
Umber, Turkey, Bnt. & Pow.....	2½@3½
Umber, Turkey, Raw & Pow.....	2½@3½
Umber, Burnt, Amer.....	1¼@2
Umber, Raw, Amer.....	1¼@2
Yellow, Chrome.....	11 @14
Vermilion, American Lead.....	10 @25
Vermilion, Quicksilver, bulk.....	@65
Vermilion, Quicksilver, bags.....	@66
Vermilion, English, Import.....	75 @80
Vermilion, Chinese.....	20.90@21.00

Colors in Oil—

Black, Lampblack.....	12 @14
Blue, Chinese.....	36 @46
Blue, Prussian.....	32 @36
Blue, Ultramarine.....	13 @16
Brown, Vandyke.....	11 @14
Green, Chrome.....	10 @15
Green, Paris.....	@21

Sienna, Raw.....	12 @15
Sienna, Burnt.....	12 @15
Umber, Raw.....	11 @14
Umber, Burnt.....	11 @14

Miscellaneous—

Barytes, White, Foreign.....	9 ton \$17.50@19.00
Barytes, Amer. floated.....	9 ton \$18.00@19.00
Barytes, Crude, No. 1.....	9 ton \$10.00@11.00
Chalk, in bulk.....	3.00@3.25
Chalk, in bbls.....	100 lb @.35
China Clay, English.....	9 ton \$11.00@17.00
Cobalt, Oxide.....	100 lb 2.50@2.60
Whiting, Common.....	100 lb .45@.48
Whiting, Gilders.....	100 lb .50@.55
Whiting, Ex. Gilders.....	100 lb .55@.60

Putty, Commercial—

In bladders.....	\$1.75@1.80
In bbls. or tubes.....	1.10@1.15
In 1 lb to 5 lb cans.....	2.05@2.95
In 12½ to 50 lb cans.....	1.45@1.60

Spirits Turpentine—

In Oil bbls.....	62 @62½
In machine bbls.....	62½@63

Glue—

Cabinet.....	11 @15
Common Bone.....	7 @8
Extra White.....	18 @24
Foot Stock, White.....	11 @14
Foot Stock, Brown.....	8 @11
German Hide.....	12 @18
French.....	10 @10
Irish.....	13 @16
Low Grade.....	9 @12
Medium White.....	14 @17

Gum Shellac—

Bleached Commercial.....	33 @35
Bone Dried.....	43 @45
Button.....	24 @45
Diamond.....	50 @57
Fine Orange.....	40 @45
A. C. Garnet.....	35 @36
O. C.....	65 @
Dacton B.....	@46
T. N. O.....	36 @38
V. S. O.....	50 @

Animal, Fish and Vegetable Oils—

Linseed, City, raw.....	50 @51
Linseed, City, boiled.....	52 @53
Linseed, State and West's raw.....	48 @49
Linseed, raw Calcutta seed.....	@60
Lard, Prime, Winter.....	56 @58
Lard, Extra No. 1.....	47 @48
Lard, No. 1.....	35 @39
Cotton-seed, Crude, f.o.b. mills.....	22 @22½
Cotton-seed, Summer Yellow,	
Prime.....	28½@29
Cotton-seed, Summer Yellow,	
off grades.....	@.
Sperm, Crude.....	55 @.
Sperm, Natural Spring.....	@.
Sperm, Bleached Spring.....	@.
Sperm, Natural Winter.....	60 @63
Sperm, Bleached Winter.....	63 @65
Tallow, Prime.....	51 @53
Whale, Crude.....	@.
Whale, Natural Winter.....	42 @44
Whale, Bleached Winter.....	44 @46
Menhaden, Brown, Strained.....	28 @29
Menhaden, Light, Strained.....	29 @30
Menhaden, Bleached, Winter.....	31 @32
Menhaden, Ex-Bld. Winter.....	32 @33
Menhaden, Southern.....	16½@17
Cocanut, Ceylon.....	9 lb 6¼@6½
Cocanut, Coch.....	9 lb 7¼@7½
Cod, Domestic, Prime.....	34 @36
Cod, Newfoundland.....	39 @41
Red Elaine.....	31 @32
Red, Saponified.....	9 lb 3¼@5
Olive, Italian, bbls.....	5 @57
Neatsfoot, prime.....	49 @50
Palm, Logos.....	9 lb 9½@9½

Mineral Oils—

Black, 29 gravity, 25@30 cold	9 gal.
test.....	10½@11½
Black, 29 gravity, 15 cold test.....	11½@12½
Black, Summe.....	10½@11½
Cylinder, light filtered.....	18 @19
Cylinder, dark filtered.....	16 @17
Paraffine, 903 gravity.....	12½@13
Paraffine, 903 gravity.....	11½@12
Paraffine, 883 gravity.....	9¼@9½
Paraffine, Red.....	11½@13
In small lots ¼¢ advance.	

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 1/3 @ 33 1/3 & 10% signifies

that the price of the goods in question ranges from 33 1/3 per cent. discount to 33 1/3 and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33 1/3%
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils..... $\frac{1}{2}$ lb 7 1/4 @ 7 1/2¢
Hay-Budden, Wrought.....9¢
Horseshoe brand, Wrought.....9¢
Trenton..... $\frac{1}{2}$ lb 9¢

Imported—

Peter Wright & Sons..... $\frac{1}{2}$ lb 10 1/2¢

Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15 & 10%

Apple Parers—See Parers,

Apple, &c.

Aprons, Blacksmiths'—

Livingston Nail Co.....33 1/3%

Augers and Bits—

Com. Double Spur.....70 & 100 @ 75%
Jennings' Patn. reg. finish 50 & 100%
Boring Mach. Augers.....70 & 100%
Car Bits, 12-in. twist.....50 & 100%
Ford's Auger and Car Bits.....40 & 65%
Forester Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. tip R. Jennings' list.....25%
No. 30, R. Jennings' list.....40 & 7 1/2%
Russell Jennings.....25 & 10 & 2 1/2%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50 & 100 @ 75%
Ohio Tool Co.'s Bailey Auger and Car Bits.....10 & 10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Drill Augers' Bits.....60%
Snell's Car Bits, 12-in. twist.....60 & 10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's small, 318, large, 3.....50 & 10%
Clark's Pattern, No. 1, $\frac{1}{2}$ doz. \$25; No. 2, \$18.....50 & 100 @ 60%
Ford's, Clark's Pattern.....50 & 100 @ 60%
C. E. Jennings & Co., Steer's Pat. 25%
Swan's.....60%

Gimlet Bits—

Common Dble. Cut..... $\frac{1}{2}$ doz. \$3.00 @ 3.25
German Pattern, Nos. 1 to 10, \$4.60; 11 to 13, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$9.00 @ 10.00
Ames.....2 & 10%
New Patent.....25 & 10%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....35 & 45%
C. E. Jennings & Co.:
I. Hommedieu's.....15%
Watrous'.....35 & 45%
Ohio Tool Co.'s.....40%
Snell's.....40%

Awl Hafts—See Hafts, Awl.

Awls—

Lad Awls:
Handled.....gro. \$2.75 @ 3.00
Unhanded, Shl'dered.....gro. \$3.75 @ 4.00
Unhanded, Patent.....gro. \$6.00 @ 7.00
Peg Awls:
Unhanded, Patent.....gro. \$1.50 @ 1.75
Unhanded, Shl'dered.....gro. \$5.00 @ 7.00
Scratch Awls:
Handled, Com.....gro. \$3.50 @ 4.00
Handled, Socket.....gro. \$11.50 @ 12.00
Hirwood.....40%

Awl and Tool Sets—See

Sets, Awl and Tool.

Axes—

Single Bit, base weights:
First Quality.....\$6.75
Second Quality.....\$6.25
Double Bit, base weights:
First Quality.....\$8.75
Second Quality.....\$8.25

Axle Grease—

See Grease, Axle

Axles—

Concord, Loose Collar..... $\frac{1}{4}$ @ 15¢
Concord, Solid Collar..... $\frac{1}{4}$ @ 15¢
No. 1 Common, Loose..... $\frac{1}{4}$ @ 35¢

No. 1 1/2 Com., New Style 3 1/4 @ 1 1/4¢
No. 2 Solid Collar..... $\frac{1}{4}$ @ 1 1/4¢
Nos. 7, 8, 11 and 12.....75 @ 100 @ 75 & 5%
Nos. 13 to 14.....70 @ 100 @ 75 & 5%
Nos. 15 to 18.....75 @ 100 @ 75 & 5%
Nos. 19 to 22.....75 @ 100 @ 75 & 5%

Boxes, Axle—

Common and Concord, not turned lb. 4 1/2 @ 5¢

Common and Concord, turned lb. 5 1/2 @ 6¢

Half Patent.....lb. 8 1/2 @ 9¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20 & 35%

Balances— Sash—

Caldwell new list.....50%
Fullman.....50 & 100 @ 60%

Spring—

Spring Balances.....60 @ 60 & 5%
Chatillon's:
Light Spg. Balances.....40 & 10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars— Crow—

Steel Crowbars, 10 to 40 lb. per lb., 2 1/4 @ 3 1/4¢

Towel

No. 10 Ideal, Nickel Plate..... $\frac{1}{2}$ doz. \$8.50

Beams, Scale—

Scale Beams.....40 & 100 @ 50%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 1 Wire Coppered $\frac{1}{2}$ doz. \$8.85; Tinned.....\$1.00
No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.10; Tinned.....\$1.20
No. 10 Wire Galvanized $\frac{1}{2}$ doz. \$1.75
Western W. G. Co.:
No. 1 Electric..... $\frac{1}{2}$ doz. \$7.50
No. 2 Buffalo..... $\frac{1}{2}$ doz. \$9.00
No. 3 Perfection Dust..... $\frac{1}{2}$ doz. \$8.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned..... $\frac{1}{2}$ doz. \$1.20
Holt, No. 1, Tinned..... $\frac{1}{2}$ doz. \$1.50
Holt, No. B, Japanned..... $\frac{1}{2}$ doz. \$2.00
Holt, No. 2, Tinned..... $\frac{1}{2}$ doz. \$2.25
Lyon, No. 2, Japanned..... $\frac{1}{2}$ doz. \$1.25
Lyon, No. 3, Japanned..... $\frac{1}{2}$ doz. \$1.50
Taplin Mfg. Co.:
No. 60 Improved Dover.....\$6.00
No. 75 Improved Dover.....\$6.50
No. 100 Improved Dover.....\$7.00
No. 102 Improved Dover, Tind. \$8.50
No. 150 Improved Dover, Hotel, Tind. \$15.00
No. 152 Imp'd Dover, Hotel, Tind. \$17.00
No. 200 Imp'd Dover Tumbler.....\$8.50
No. 202 Imp'd Dover Tumbler, Tind. \$9.50
No. 300 Imp'd Dover Mammoth, $\frac{1}{2}$ doz. \$25.00
Western, W. G. Co., Buffalo.....\$7.00
Wonder (S. S. & Co.), $\frac{1}{2}$ doz. net, \$6.00

Bellows—

Blacksmith, Standard List.....60 & 100 @ 70 & 10%

Blacksmiths'—

Inch.....30 32 34 36 38 40
Each \$3.25 3.50 4.00 4.50 5.00 5.75

Extra Length:

Each \$3.75 4.25 4.75 5.25 6.00 7.00

Hand—

Inch.....6 7 8 9 10
Doz.....\$4.50 5.00 5.50 6.00 6.50

Molders—

Inch.....9 10 11 12 14
Doz.....\$8.00 9.00 10.50 12.50 14.50

Bells— Cow—

Ordinary goods.....75 & 50 @ 75 & 10 & 5%
High grade.....70 & 100 @ 70 & 10 & 5%
Jersey.....75 & 10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55 & 10%
Lever and Pull, Sargent's.....60 & 10 & 10%
Trip Gong.....50 & 10 @ 50 & 10 & 5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.....60 & 50 @ 60 & 10 & 5%
White Metal.....60%

Nickel Plated.....50 & 10 @ 50 & 10 & 5%
Swiss.....60 @ 60 & 7 1/2%
Cone's Globe Hand Bells.....33 1/3 @ 35%
Silver Chime.....33 1/3 @ 35%

Miscellaneous—

Farm Bells.....lb. 2 1/4¢
Steel Alloy Church and School.....50 & 10 & 50 @ 60 & 5%

American Tube & Stamping Co.
Gonga.....75%
Table Call Bells.....50 @ 50 & 10%

Belting— Leather—

Extra Heavy, Short Lap.....60 @ 60 & 5%
Regular Short Lap.....65 @ 100 @ 70%

Standard.....70 & 50 @ 70 & 10%

Light Standard.....70 & 100 @ 75%

Cut Leather Lacing.....60 & 10%

Leather Lacing Sides, per sq. ft. 17 1/2 @ 18¢

Rubber—

Agricultural (Low Grade).....75 @ 75 & 5%

Common Standard.....70 @ 70 & 10%

Standard.....65 & 70%

Extra.....60 & 50 @ 60 & 10%

High Grade.....50 & 50 @ 50 & 10%

Bench Stops—

See Stops, Bench

Benders and Upsetters,

Tire—

Detroit Perfected Tire Bender.....40%

Green River Tire Benders and Upsetters.....20%

Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25; No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

Bicycle Goods—

John S. Leng's Son's 1902 list:
Chain.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks— Tackle—

Common Wooden.....70 & 10 @ 75 & 5%

Hartz St. Tackle Blocks.....50 & 50 & 5%

Hollow Steel Blocks, with Ford's Patent Sheaves.....50 & 10%

Lane's Patent Automatic Lock and Junior.....50 & 10%

Stowell's Novelty, Mal. Iron.....50 & 10%

Stowell's Self Loading.....60%

See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....30 & 10 @ 40 & 10%

Boards, Wash—

See Washboards.

Bobs, Plum—

Keuffel & Escher Co.....33 1/3%

Boils—

Carriage, Machine, &c.—

Common Carriage (cut thread):
3/4 & 6 and Smul'er.....75 & 10%

Larger and Smul'er.....70 & 7 1/2%

Phila. Eagle \$3.00 list May 21, '99

Bolt Ends, list Feb. 1, '95.....70 & 2 1/4%

Machine, 3/4 & 4 and smaller.....75 & 2 1/4%

Machine, larger and longer.....70 & 5%

Door and Shutter—

Cast Iron Barrel, Japanned,
Round Brass Knob:
Inch.....3 4 5 6 8
Per doz. \$9.30 35 45 56 75

Cast Iron Spring Foot, Jap'd:
Inch.....6 8 10
Per doz.....\$1.15 1.40 2.00

Cast Iron Chain, Flat Japanned:
Inch.....6 8 10
Per doz.....\$0.95 1.25 1.55

Cast Iron Shutter, Japanned,
Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.80 .90 1.20

Wrt Barrel Jap'd.....80 @ 80 & 10%

Wrt.....50 @ 50 & 10%

Wrt, Spring.....70 & 100 @ 70 & 10 & 10%

Wrt, Shutter.....50 & 50 @ 50 & 10 & 10%

Wrt, Square Neck.....75 @ 75 & 10%

Wrt Square.....66 @ 100 @ 66 1/2 & 10 & 10%

Ivory Patent Door.....60%

Plow and Stove

Plow.....65 & 10 @ 65 & 10 & 10%

Stove.....82 1/2 @ 10 @ 82 1/2 & 10 & 5%

Tire—

Common.....80%

Norway Iron.....80%

American Screw Company:
Norway Phila., list Oct. 16, '84.....80%

Eagle Phila., list Oct. 16, '84.....82%

Bay State, list Dec. 28, '99.....80%

Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%

Eagle Phila., list Oct. 16, '84.....82%

Eclipse, list Dec. 28, '99.....80%

Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84.....80%

Eagle Phila., list Oct. 16, '84.....82%

Mount Carmel, list Dec. 28, '99.....80%

Russell, Burdall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%

Norway Phila., list Oct., '84.....80%

Lapson Nut Co.:
Tire Bolts.....70 1/2%

Borers, Tap—

Borers Tap, Ring, with Handle:
Inch.....1/4 1/2 3/4 1 2
Per doz.....\$1.80 5.60 6.40 8.00

Inch.....2 1/2 3 4
Per doz.....\$6.65 11.50

Enterprise Mfg. Co., No. 1, \$1.25; No. 2, \$1.65; No. 3, \$2.50 each.....25%

Boxes, Mitre—

C. E. Jennings & Co.....30%

Langdon.....15 & 10%

Perfection..... $\frac{1}{2}$ doz. \$30.00

Schaltz.....45%

Stanley R. & L. Co.:
Nos. 240 to 460.....30%

Nos. 50 and 60.....35%

Braces—

Common Ball American \$1.25 @ 1.30

Harber's.....50 & 100 @ 100 & 10%

Pray's Genuine Spofford's.....60%

Pray's No. 70 to 120, 81 to 123, 207 to 411.....60%

C. E. Jennings & Co.....50 & 5%

Mayhew's Ratchet.....60%

Mayhew's Quick Action Hay Pat.....50%

Millers Falls Drill Braces.....25 & 10%

P. S. & W. Co., Peck's Pat. 60 & 100 @ 65%

Stanley R. & L. Co.:
Stanley.....35%

Victor.....45%

Brackets—

Wrought Steel.....80 & 10 @ 80 & 10 & 5%

Bradley's Wire Shelf:
Full cases.....80 & 10%

Broken cases.....80 & 10%

Griffin's Pressed Steel.....80 @ 80 & 10%

Griffin's Folding Brackets.....70 & 10%

Stowell's Cast Shelf.....75%

Stowell's Sink.....50%

Western, W. G. Co., Wire.....60 & 10%

Bright Wire Goods—

See Wire and Wire Goods.

Boilers—

Kilbourne Mfg. Co.....75 & 20%

Western, W. G. Co.....75 & 20%

Wire Goods Co.....75 & 20

Hendryx Bronze:	40&10%
700, 800 series:	40&10%
Hendryx Enamelled:	40&10%
Calipers—See Compasses.	
Calks, Toe and Heel—	
Blunt, 1 prong.....	per lb. 4¢
Sharp, 1 prong.....	per lb. 4¢
Gautier, Blunt.....	per lb. 4¢
Gautier, Sharp.....	per lb. 4¢
Perkins, Blunt Toe.....	per lb. 3.65¢
Perkins, Sharp Toe.....	per lb. 1.15¢
Can Openers—	
See Openers, Can.	
Cans, Milk—	
Illinois Pattern.....	5 8 10 gal.
New York Pattern.....	1.50 1.85 2.05 each.
Baltimore Pattern.....	1.50 2.20 2.45 each.
Dubuque.....	1.55 1.60 1.75 each.
Cans, Oil—	
Buffalo Family Oil Cans:	
3 5 10 gal.	
\$18.00 60.00	125.60 gro., net.
Caps, Percussion—	
Eley's E. B.....	50¢/55¢
G. D.....	per M 34¢/35¢
F. L.....	per M 40¢/42¢
G. E.....	per M 45¢/50¢
Musket.....	per M 62¢/63¢
Primers—	
Berdan Primers, \$2 per M.....	80%
B. L. Caps (Starveant Shells).....	20%
\$2 per M.....	20%
All other primers per M.....	\$1.52¢/1.60
Cartridges—	
Blank Cartridges:	
32 C. F., \$5.50.....	1065%
38 C. F., \$7.00.....	1065%
22 cal. Rim, \$1.50.....	1065%
32 cal. Rim, \$2.75.....	1065%
B. B. Caps, Con. Ball, Sgnd.....	\$1.90
B. B. Caps, Round Ball.....	\$1.49
Central Fire.....	25%
Target and Sporting Rifle.....	1565%
Primed Shells and Bullets.....	1565%
Rim Fire, Sporting.....	1565%
Rim Fire, Military.....	1565%
Casters—	
Bed.....	70¢/70¢/10%
Plate.....	60¢/10¢/60¢/1065%
Philadelphia.....	75¢/75¢/10%
Acme, Ball Bearing.....	33%
Boss.....	70¢/10%
Boss Anti-Friction.....	70¢/10%
Gen. (Roller Bearing).....	45%
Martin's Patent (Flange).....	45%
Standard Ball Bearing.....	45%
Tucker's Patent low lat.....	30%
Xale (Double Wheel) low lat.....	30%
Cattle Leaders—	
See Leaders, Cattle.	
Chain, Coil—	
American Coil, Straight Link:	
3-16 1/4 5-16 3/4 7-16 1/2 9-16	
\$7.50 5.35 4.30 3.70 3.55 3.45 3.40	
5/8 3/4 1 to 1 1/2 inch.	
\$3.35 3.30 3.25 3.25 per 100 lb.	
German Coil.....	60¢/10¢/60¢/10%
Halters and Ties—	
Halter Chains.....	60¢/10¢/60¢/10%
German Pattern Halter Chains.....	60¢/10¢/60¢/10%
List July 24, '97.....	60¢/10¢/60¢/10%
Cow Ties.....	60¢/10¢/60¢/10%
Traces, Wagon, &c.—	
Traces, Western Standard: 100 pr.	
6 1/2-6-3, Strght, with ring.....	\$23.50
6 1/2-6-3, Strght, with ring.....	\$24.50
6 1/2-8-2, Strght, with ring.....	\$28.00
6 1/2-10-2, Strght, with ring.....	\$32.00
NOTE—Add 2¢ per pair for Hooks.	
Twist Traces 2¢ per pair higher than	
Straight Link.	
Trace, Wagon and Fancy	
Chains.....	60¢/5¢/60¢/1065%
Miscellaneous—	
Jack Chain, list July 10, '93:	
Iron.....	60¢/10¢/60¢/1065%
Brass.....	60¢/10¢/60¢/1065%
Safety Chain.....	75¢/10¢/60¢/1065%
Gal. Pump Chain.....	lb. 5¢/54%
Covert Mfg. Co.:	
Breast.....	35¢/55%
Halter.....	35¢/55%
Heel.....	35¢/55%
Rein.....	35¢/55%
Stallion.....	35¢/55%
Covert Sad. Works:	
Breast.....	70%
Halter.....	70%
Hold Back.....	70%
Rein.....	70%
Oneida Community:	
Am. Coil and Halters.....	40¢/1065%
Am. Cow Ties.....	45¢/50%
Eureka Coil and Halter.....	45¢/5065%
Niagara Coil and Halter.....	45¢/5065%
Niagara Cow Ties.....	45¢/5065%
Niagara Wire Dog Chains.....	45¢/5065%
Wire Goods Co.:	
Dog Chain.....	70¢/10%
Universal Dbl. Jointed Chain.....	50%
Chalk—(From Jobbers.)	
Carpenters' Blue.....	gro. 35¢/38¢
Carpenters' Red.....	gro. 30¢/33¢
Carpenters' White.....	gro. 25¢/28¢
See also Crayons.	
Checks, Door—	
Bardsley's.....	45%
Columbia.....	50&10%
Eclipse.....	60&10%
Chests, Tool—	
American Tool Chest Co.:	
Boys' Chests, with Tools.....	55%
Youths' Chests, with Tools.....	40%
Gentlemen's Chests, with Tools.....	30%
Farmers' Chests, with Tools.....	20%
Farmers' Carpenters', etc., Chests,	
with Tools.....	20%
Machinists' and Pipe Fitters'	
Chests, Empty.....	50%
Tool Cabinets.....	50%
C. E. Jennings & Co.'s Machinists'	
Tool Chests.....	33 1/3&10%

Chisels—	
Socket Framing and Firmer	
Standard List.....	75¢/75¢/10%
Buck Bros.....	30%
Charles Buck.....	30%
C. E. Jennings & Co. Socket Firmer	
No. 10.....	60%
C. E. Jennings & Co. Socket Fram-	
ing No. 15.....	60%
Ohio Tool Co.'s.....	70%
Swan's.....	70%
L. & J. White.....	30¢/30&5
Tanged—	
Tanged Firmers 33 1-3¢/33 1-3¢/10%	
Buck Bros.....	30%
Charles Buck.....	30%
C. E. Jennings & Co. Nos. 191, 181, 25	
L. & J. White, Tanged.....	25&5
Cold—	
Cold Chisels, good quality.....	13¢/15¢
Cold Chisels, fair quality.....	11¢/12¢
Cold Chisels, ordinary.....	9¢/10¢
Chucks—	
Beach Pat., each \$8.00.....	35&5
Empire.....	25%
Blacksmiths.....	25%
Jacobs' Drill Chucks.....	25%
Pratt's Positive Drive.....	25%
Skinner Patent Chucks.....	50%
Independent Lathe Chucks.....	50%
Combination.....	50%
Drill Chucks, New Model.....	50%
Drill Chucks, Standard.....	45%
Drill Chuck, Skinner Pat., 0, 1, 2, 35	
Drill Chucks, Skinner Pat., 3, 4, 5,	
6, 7, 8.....	45%
Drill Chucks, Positive Drive.....	50%
Planer Chucks.....	25%
Face Plate Jaws.....	40%
Standard Tool Co.:	
Improved Drill Chuck.....	45%
Union Mfg. Co.:	
Combination.....	50%
Craz Drill.....	35%
Combination Geared Scroll.....	40%
Geared Scroll.....	40%
Independent.....	50%
Independent Steel.....	40%
Union Drill.....	50%
Universal.....	50%
Independent Iron F. Plate Jaws.....	40%
Independent Steel F. Plate Jaws.....	40%
Westcott Patent Chucks:	
Lathe Chucks.....	50%
Little Giant Auxiliary Drill.....	50%
Little Giant Double Grip Drill.....	50%
Little Giant Drill, Improved.....	50%
Oneida Drill.....	50%
Scroll Combination Lathe.....	50%
Clamps—	
Adjustable, Hammers.....	20¢/20&5
Cabinet, Sargent's.....	50&10%
Carriage Makers, P. S. & W. Co.....	50%
Carriage Makers, Sargent's.....	35&10%
Resly Parallel.....	35&10%
Linnair, U. S. Drop Forge & Tool	
Co.....	40%
Saw Clamps, see Vises, Saw Filers.	
Cleaners, Drain—	
Iwan's Champion, Adjustable.....	55%
Iwan's Champion, Stationary.....	45%
Sidewalk—	
Star Socket, All Steel.....	per doz. \$4.05 net
Star Shank, All Steel.....	per doz. \$3.24 net
W. & C. Shank, All Steel.....	per doz.,
7 1/2 in., \$3.00; 8 in., \$3.25.	
Cleavers, Butchers'—	
Foster Bros.....	30%
New Haven Edge Tool Co.....	35&10%
Fayette R. Plumb.....	35&10%
L. & J. White.....	30%
Clippers—	
Chicago Flexible Shaft Company:	
'98 Chicago Horse.....	\$8.75 15%
1902 Chicago Horse.....	\$10.75 15%
20th Century Horse, each.....	\$5.00 20%
Lightning Belt.....	\$15.00 15%
Chicago Belt.....	\$20.00 15%
Stewart's Patent Sheep.....	\$12.75 20%
Finger Nail Clippers—	
Smith & Hemenway Co.....	per doz. net \$2.00
Clips, Axle—	
Eagle, 5-16 and 3/4 in.....	75¢/75¢/10%
Norway, 5-16 and 3/4 in.....	60¢/10¢/70%
Cloth and Netting, Wire	
—See Wire, &c.	
Cocks, Brass—	
Hardware list:	
Compression, Plain Bibbs.....	35&5%
Globe, Kerosene, Racking.....	35&5%
&c., Cocks.....	70¢/10¢/75%
Coffee Mills—	
See Mills, Coffee.	
Collars, Dog—	
Nickel Chain, Walter B. Stevens &	
Son's list.....	40%
Leather, Walter B. Stevens & Son's	
list.....	40%
Combs, Curry—	
Metal Stamping Co.....	40%
Mane and Tail—	
Covert's Saddlery Works.....	60&10%
Compasses, Dividers, &c.—	
Ordinary Goods.....	75¢/65¢/175¢/10%
Bemis & Call Hdw. & Tool Co.:	
Dividers.....	65%
Calipers, Double.....	65%
Calipers, Inside or Outside.....	65%
Calipers, Wing.....	65%
Compasses.....	50%
Conductor Pipe—	
L. C. L. to Dealers:	
Galvanized.	
Territory. Nested. Not nested.	
Eastern.....	70¢/15%
Central.....	70¢/15%
Southern.....	70¢/21 1/2%
So. Western.....	60¢/20%
Copper.	
Eastern.....	1¢/16 oz.
Central.....	50¢/10%
Southern.....	50¢/7 1/2%
So. Western.....	50¢/21 1/2%
Terms, 60 days 2% cash 10 days.	
Factory shipments generally delivered.	
See also Eave Troughs.	

Coolers, Water—	
Gal. each.....	2 3 4 6 9
Labrador.....	\$1.20 \$1.50 \$1.80 \$2.10 \$2.70
Gal.....	3 4 6 8
Iceland, ea.....	\$1.50 \$2.10 \$2.40 \$3.00
Gal.....	2 3 4 6 8
Galv. Lined, ea.....	\$1.85 \$2.00 \$2.25 \$2.90 \$3.90
Galv. Lined, side handles.....	25%
Gal.....	2 3 4 6 8
Each.....	\$1.35 \$2.15 \$2.40 \$3.30 \$4.15 25%
Coopers' Tools—	
See Tools, Coopers.	
Cord— Sash—	
Braided, Drab.....	lb. 35¢
Braided White, Com. lb.....	21¢/22 1/2%
Cable Laid Italian.....	lb. A, 18¢; B, 16¢
Common India.....	lb. 10¢/10 1/2%
Cotton Sash Cord, Twisted.....	11¢/17¢
Patent Russia.....	lb. 6¢/14¢
Cable Laid Russia.....	lb. 6¢/15¢
India Hemp, Braided.....	lb. 6¢/15¢
India Hemp, Twisted.....	lb. 12¢/13¢
Patent India, Twisted.....	lb. 12¢/13¢
Amniston Cordage Co.:	
Braided Cotton.....	lb. 25¢
Old Colony, Nos. 7 to 12.....	lb. 22¢
Amniston, Nos. 7 to 12.....	lb. 22¢
Old Colony, Nos. 7 to 12.....	lb. 22¢
Amniston Drab, Nos. 7 to 12.....	lb. 26¢
Pearl Braided, cotton, No. 6.....	lb. 40¢
22 1/2¢; No. 7, 21 1/2¢; Nos. 8 to 12, 21¢	
Eddystone Braided, Nos. 7, 8, 9 and	
10.....	lb. 25¢
Eddystone Braided Cotton.....	lb. 25¢
Harmony Cable Laid Italian, Nos. 7	
to 10.....	lb. 25¢
Peelless.....	lb. 25¢
Cable Laid Italian.....	16¢
Cable Laid Russian.....	14¢
Cable Laid India.....	12¢
Braided India.....	18¢
Samson, Nos. 8 to 12:	
Braided, Drab Cotton.....	lb. 40¢
Braided, Italian Hemp.....	lb. 40¢
Braided, Linen.....	lb. 55¢
Braided, White Cotton or Spot.....	lb. 35¢
Massachusetts, White.....	lb. 28¢
Massachusetts, Drab.....	lb. 32¢
Whelan, White, Nos. 8 to 12, 24¢	
No. 7, 24 1/2¢; No. 6, 25 1/2¢.	
Silver Lake:	
A quality, Drab.....	40¢
A quality, White.....	35¢
B quality, Drab.....	35¢
B quality, White.....	30¢
Italian Hemp.....	40¢
Linen.....	57 1/2%
Wire, Picture—	
List Oct., '00.....	85¢/10¢/85¢/10¢/1065%
Hendryx Standard Wire Picture Cord.....	85¢/1065%
Cradles—	
Grain.....	40¢/12 1/2%
Crayons—	
White Round Crayons, gr. 5 1/2.....	66¢
Cases, 100 gro., \$1.00, at factory.	
D. M. Steward Mfg. Co.:	
Jumbo Crayons.....	gr. \$3.50 20%
Metal Workers' Crayons, gr. \$2.50	
Soapstone Pencils, round, flat	
or square.....	gr. \$1.50
Rolling Mill Crayons.....	gr. \$2.50
Railroad Crayons (composition)	
Case lots.....	gr. \$2.00
Zelnicker's Lumber:	
Red, Blue, Green.....	per gro. \$6.50
Black.....	per gro. \$4.00
See also Chalk.	
Crooks, Shepherds'—	
Fort Madison, Heavy.....	per doz. \$7.00
Fort Madison, Light.....	per doz. \$6.50
Crow Bars—See Bars, Crow.	
Cultivators—	
Victor Garden.....	50%
Cutlery, Table—	
International Silver Company:	
No. 12 M'd'm Knives, 1847.....	per doz. \$3.50
Star, Eagle, Rogers & Hamilton	
and Anchor.....	per doz. \$3.00
Wm. Rogers & Son.....	per doz. \$2.50
Cutters— Glass—	
H. H. Mayhew Co.....	40%
Red Devil.....	40%
Smith & Hemenway Co.....	50%
Woodward.....	40%
Meat and Food—	
American.....	30%
Nos.....	1 2 3 4 5
Each.....	\$5 \$7 \$10 \$25 \$50 \$60
Enterprise.....	25¢/25¢/71 1/2%
Nos.....	5 10 12 22 32
Dixons.....	\$2 \$3 \$2.75 \$4.50 \$6
Nos.....	per doz. 30¢/10¢/40%
Ideal.....	\$14.00 \$17.00 \$19.00 \$30.00
Little Giant.....	40¢/1065%
Nos.....	325 310 312 320 322
N. E. Food Choppers.....	\$48.00 \$44.00 \$72.00 \$68.00
New Triumph No. 605.....	per doz. \$24.00
Russwin Food, No. 1.....	\$24.00; No. 2,
\$27.00.....	45¢/10¢/10%
Woodruff's.....	per doz. 30¢/10¢/40%
Nos.....	100 150
Enterprise Beef Shavers.....	\$15.00 \$18.00
Slaw and Kraut—	
Henry Diston & Sons:	
Slaw, Corn Grater, &c.....	40%
Kraut Cutters, 24 x 7, 26 x 8, 30	
x 9.....	55%
Kraut Cutters, 36 x 12, 40 x 12.....	40%
J. M. Mast Mfg. Co.:	
Slaw Cutters, 1 Knife.....	per doz. \$3.00
Combined Slaw Cutter and Corn	
Grater.....	per doz. \$4.00
Tucker & Dorsey Mfg. Co.:	
Kraut Cutters.....	40%
Slaw Cutters, 1 Knife.....	per gr. \$18¢/20
Slaw Cutters, 2 Knife.....	per gr. \$22¢/36

Tobacco—	
All Iron, Cheap.....	per doz. \$4.25¢/4.50
Enterprise.....	25¢/30%
National, per doz., No. 1.....	\$21.10
\$18.....	40%
Sargent's.....	per doz. No. 2.....
Sargent's.....	Nos. 12 and 21.....60&10%
Washer—	
Appleton's.....	per doz., \$16.00.....50&10&10%
Diggers, Post Hole, &c.—	
Dalbey Post Hole Auger.....	per doz. \$9.00
Iwan's Improved Post Hole Auger.....	10&5%
Iwan's Vaughan Pattern Post Hole	
Augers.....	per doz. \$6.25
Iwan's Perfection Post Hole Digger.....	per doz. \$8.25
Iwan's Split Handle Post Hole Dig-	
gers.....	per doz. \$7.25
Kohler's Universal.....	per doz. \$15.00
Kohler's Little Giant.....	per doz. \$12.00
Kohler's Hercules.....	per doz. \$10.00
Kohler's Invincible.....	per doz. \$9.00
Kohler's Rival.....	per doz. \$8.00
Kohler's Pioneer.....	per doz. \$7.20
Never-Break Post Hole Diggers.....	per doz. \$24.00
Samson.....	per doz. \$34.00.....25%
Dividers—See Compasses.	
Doors, Screen—	
Phillips', style E, 5 in.....	per doz. \$10.00
Phillips', style 077, 5 in.....	per doz. \$7.50
Phillips', style x-y, 5 in.....	per doz. \$10.50
Drawers, Money—	
Tucker's Pat. Alarm Till No. 1.....	per doz. \$13; No. 2, \$15; No. 3, \$12;
No. 4, \$18.	
Drawing Knives—	
See Knives, Drawing.	
Dressers, Emery Wheel—	
Diamond Emery Wheel Dressers.....	35%
Diamond Wheel Dresser Cutters.....	35%
Drills and Drill Stocks—	
Common Blacksmiths' Drill,	
each.....	\$1.50¢/1.75
Breast, Millers Falls.....	10&10%
Breast, P. S. & W.....	10&5%
Goodell Automatic Drills.....	10&5¢/10&10%
Johnson's Automatic Drills, Nos. 2	
and 3.....	165%
Johnson's Drill Points.....	165%
Millers Falls Automatic Drills.....	35&10%
Ratchet, Curtis & Curtis.....	25%
Ratchet, Parker's.....	40%

Faucets—

Cork Lined.....**70¢@10¢**
 Metallic Key, Leather Lined.....**60¢@10¢**
 Red Cedar.....**40¢@10¢**
 Petroleum.....**70¢@10¢**
 B. & L. B. Co.'s.....**60¢@10¢**
 Metal Key.....**60¢@10¢**
 Star.....**60¢@10¢**
 West Lock.....**50¢@10¢**
 John Sommer's Peerless Tin Key.....**40¢**
 John Sommer's Boss Tin Key.....**50¢**
 John Sommer's Victor Mfg. Key.....**50¢@10¢**
 John Sommer's Duplex Metal Key.....**60¢**
 John Sommer's Diamond Lock.....**40¢**
 John Sommer's I. X. L. Cork Lined.....**50¢**
 John Sommer's Reliable Cork Lined.....**60¢@10¢**

John Sommer's Chicago Cork Lined.....**50¢**
 John Sommer's O. K. Cork Lined.....**50¢**
 John Sommer's No Brand, Cedar.....**50¢**
 John Sommer's Perfection, Cedar.....**40¢**
 McKenna, Brass.....**25¢**
 Burglar Proof, N. P.....**25¢**
 Improved, 1/4 and 1/2 inch.....**25¢**
 See Measuring.....**40¢@10¢**
 Lane's, 1/2 doz. \$36.00.....**40¢@10¢**
 National Measuring, 1/2 doz. \$36.00.....**40¢@10¢**

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List revised Nov. 1, 1899.

Best Brands.....**70¢@10¢**
 Standard Brands.....**75¢@10¢**
 Lower Grade.....**75¢@10¢**

Imported—

Stub's Tapers, Stub's list, July 24, '97.....**33 1/3-40¢**

Fixtures, Fire Door—

Richards Mfg. Co.:
 Universal, No. 10.....**\$4.00**
 Special, No. 104.....**\$4.00**
 Fusible Links.....**\$0.25**
 Expansion Bolts.....**\$0.40@10¢**

Grindstone—

Net Prices:
 Inch.....**15 17 19 21 24**
 Per doz.....**\$2.15 2.85 3.25 3.75 4.50**
 P. S. & W. Co.....**30¢@10¢**
 Reading Hardware Co.....**70¢**
 Sargent's.....**70¢**
 Stowell's Giant Grindstone Hanger.....**40¢**
 Stowell's Grindstone Fixtures, Extra Heavy.....**50¢@10¢**
 Stowell's Grindstone Fixtures, Light.....**60¢@10¢**

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Easy Potato.....**60¢@10¢**
 Victor, Hay.....**60¢@15¢**
 Victor, Manure.....**60¢**
 Victor, Header.....**60¢**
 Champion, Hay.....**60¢@15¢**
 Champion, Header.....**60¢@15¢**
 Columbia, Hay.....**60¢@10¢**
 Columbia, Manure.....**70¢@12¢**
 Columbia, Spading.....**70¢@12¢**
 Hawkeye Wood Barley.....**40¢**
 W. & C. Potato Digger.....**40¢**
 Acme Hay.....**60¢@10¢**
 Acme Manure, 4 line.....**60¢@10¢**
 Dakota Header.....**60¢@20¢**
 Jackson Steel Barley.....**60¢@20¢**
 Kansas Header.....**60¢**
 W. & C. Favorite Wood Barley.....**40¢**
 Plated.—See Spoona.

Frames— Saw—

White, 8'x1 Bar, per doz.....**75¢@80¢**
 Red, 8'x1 Bar, per doz.....**\$1.00@1.25**
 Red, Dbl. Brace, per doz.....**\$1.40@1.50**

Freezers, Ice Cream—

Qt.**1 2 3 4 6**
 Each.....**\$1.30 \$1.60 \$1.90 \$2.20 \$2.80**

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.**Fuse— Per 1000 Feet.**

Hemp.....**\$2.75**
 Cotton.....**3.20**
 Waterproof Sgl. Taped.....**3.65**
 Waterproof Dbl. Taped.....**4.40**
 Waterproof Tpl. Taped.....**5.15**

Gates, Molasses and Oil—

Stebbins' Pattern.....**80¢@10¢**

Gauges—

Marking, Mortise, do.....**50¢@10¢**
 Chapin-Stephens Co.:
 Marking, Mortise, do.....**50¢@10¢**
 Scholl's Patent.....**50¢@10¢**
 Door Hangers.....**50¢@10¢**
 Stanley R. & L. Co.'s Butt and Rabbit Gauge.....**35¢**
 Marking and Mortise.....**60¢**
 Wire, Brown & Sharpe's.....**25¢**
 Wire, Morse's.....**25¢**
 Wire, P. S. & W. Co.....**30¢@10¢**

Gimlets— Single Cut—

Numbered assortments, per gro.
 Nail, Metal, No. 1.....**\$2.00**
 Spike, Metal, No. 1.....**\$1.40**
 Nail, Wood Handled, No. 1.....**\$2.50**
 Spike, Wood Handled, No. 1.....**\$1.30**
 Nail, Wood Handled, No. 2.....**\$2.60**
 Spike, Wood Handled, No. 2.....**\$1.40**

Class, American Window

See Trade Report.

Glasses, Level—

Chapin-Stephens Co.....**60¢@10¢**

Glue, Liquid Fish—

Bottles or Cans, with Brush.....**25¢@50¢**

Cans (1/2 pts., pts., qts., 1/2 gal., gal.).....**25¢@48¢**

International Glue Co. (Martin's).....**40¢@10¢**

Grease, Axle—

Common Grade.....**gro. \$4.50@5.50**

Dixon's Everlasting.....**10-lb pails, ea. 85¢**

Dixon's Everlasting, in boxes, 1/2 doz. 1 lb., \$1.20; 2 lb., \$2.00

Grips, Nipple—

Perfect Nipple Grips.....**40¢@10¢**

Griddles, Soapstone—

Pike Mfg. Co.....**33¢@39¢**

Grindstones—

Bicycle Emery Grinder.....**\$6.50**

Bicycle Grindstones, each.....**\$2.50@3.00**

Pike Mfg. Co.:
 Improved Family Grindstones, per inch, 1/2 doz.....**\$2.00**

Pike Mower and Tool Grinder.....**\$2.00**

Velox Ball Bearing, Mounted, Angle Iron Frames, each.....**\$3.25**

Halters and Ties—

Covert Mfg. Co.:
 Web.....**35¢@5¢**

Jute Rope.....**30¢@10¢**

Sisal Rope.....**45¢**

Cotton Rope.....**45¢**

Hemp Rope.....**45¢**

Covert's Saddlery Works:
 Web and Leather Halters.....**70¢**

Jute and Manila Rope Halters.....**60¢**

Sisal Rope Halters.....**60¢**

Jute, Manila and Cotton Rope Ties.....**70¢**

Sisal Rope Ties.....**60¢@10¢**

E. T. Rugg & Co.:
 Leather Halters.....**50¢**

Web Halters and Webbing.....**60¢**

Jute and Sisal Rope Halters.....**60¢**

Ties.....**60¢**

Cotton Horse Ties.....**60¢**

Livery Ties, Braided.....**60¢**

Hammers—**Handled Hammers—**

Heller's Machinists.....**40¢@10¢**

Heller's Farriers.....**40¢@10¢**

Magnetic Tack, Nos. 1, 2, 3.....**\$1.25**

Peck, Stow & Wilcox.....**40¢@10¢**

Fayette R. Plumb:
 Plumb, A. E. Nail.....**33¢@7¢**

Engineers' and R. S. Hand.....**50¢@10¢**

Machinists' Hammers.....**50¢@10¢**

Riveting and Tinners.....**40¢@10¢**

Sargent's C. S. New List.....**40¢**

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢.....**80¢@10¢**

3 to 5 lb., per lb. 40¢.....**40¢@10¢**

Over 5 lb., per lb. 30¢.....**85¢@10¢**

Wilkinson's Smiths'.....**10¢@10¢**

Handles—

Agricultural Tool Handles
 Aze, Pick, do.....**60¢@10¢**

Hoe, Rake, do.....**45¢@50¢**

Pork, Shovel, Spade, do.....**45¢@50¢**

Long Handles.....**45¢@50¢**

D Handles.....**40¢**

Cross-Cut Saw Handles—

Atkins.....**40¢@5¢**

Champion.....**45¢@10¢**

Diaston's.....**50¢**

Mechanics' Tool Handles—

Auger, assorted.....**gro. \$2.50@2.85**

Brad Axl.....**gro. \$1.65@1.85**

Chisel Handles:

Apple Tanged Firmer, gro. assorted.....**\$2.40@2.65**

Hickory Tanged Firmer, gro. assorted.....**\$2.15@2.40**

Apple Socket Firmer, gro. assorted.....**\$1.75@1.95**

Hickory Socket Firmer, gro. assorted.....**\$1.45@1.60**

Hickory Socket Framing, gro. assorted.....**\$1.60@1.75**

File, assorted.....**gro. \$1.30@1.50**

Hammer, Hatchet, Aze, do.....**60¢@10¢**

Hand Saw, Varnished, do.....**80¢@85¢**

Not Varnished.....**65¢@75¢**

Plane Handles:

Jack, doz. 30¢; Jack, Bolted.....**75¢**

Fore, doz. 45¢; Fore, Bolted.....**90¢**

Chapin-Stephens Co.:
 Carving Tool.....**40¢@10¢**

Chisel.....**65¢@6.10¢**

File and Awl.....**40¢@10¢**

Saw and Plane.....**40¢@10¢**

Screw Driver.....**40¢@10¢**

Millers Falls Adj. and Ratchet Auger Handles.....**15¢@10¢**

Nicholson Simplicity File Handle.....**1/2 gro. \$0.85@1.50**

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, do

Barn Door, New Pattern, Round Groove, Regular:
 Inch.....**3 4 5 6 8**
 Single Doz.....**\$0.90 1.25 1.50 1.95 2.50**

Barn Door, New England Pat-

tern, Check Back, Regular:

Inch.....**3 4 5 6**
 Single Doz.....**\$1.30 1.85 2.50 3.00**

Albion Mfg. Co.:
 Reliable, No. 1.....**per doz. \$8.00**

Reliable, No. 2.....**per doz. \$9.00**

Chicago Spring Butt Co.:
 Friction.....**25¢**

Oscillating.....**25¢**

Big win.....**25¢**

Chatham & Moore Mfg. Co.:
 Baggage Car Door.....**50¢**

Elevator.....**30¢**

Railroad.....**50¢**

Cronk & Carrier Mfg. Co.:
 Loose Axle.....**60¢@10¢**

Roller Bearing.....**75¢@45¢**

Griffin Mfg. Co.:
 Solid Axle, No. 10.....**\$12.00**

Roller Bearing, No. 11.....**\$15.00**

Roller Bearing, Ex. Hy., No. 22.....**\$18.00**

Hinged Hangers.....**\$10.00**

Large Bros. Co.:
 Parlor Ball Bearing.....**\$1.00**

Parlor, Standard.....**\$1.15**

Parlor, No. 105.....**\$2.85**

Parlor, New Model.....**\$2.80**

Parlor, New Champion.....**\$2.25**

Barn Door, Standard.....**\$0.40**

Hinged.....**net \$6.40**

Covered.....**60¢@10¢**

Special.....**70¢@5¢**

Lawrence Bros.:
 Advance.....**60¢@10¢**

Cleveland.....**60¢@10¢**

Clipper, No. 75.....**60¢@10¢**

Crown.....**60¢@10¢**

Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25.....**60¢@5¢**

Giant.....**60¢@5¢**

Hummer.....**60¢@10¢**

New York.....**70¢@10¢**

Peerless.....**70¢@5¢**

Sterling.....**60¢@10¢**

McKinney Mfg. Co.:
 No. 1, Special.....**\$15.00**

No. 2, Standard.....**\$12.00**

Hinged Hangers.....**\$16.00**

Meyers' Stanyon Hangers.....**60¢**

Richards Mfg. Co.:
 Pioneer Wood Track No. 3.....**\$2.15**

Ball B'r'g St'l Track No. 10.....**\$2.40**

Roller B'r'g St'l Track No. 12.....**\$2.30**

Ball B'r'g St'l Track No. 13.....**\$2.40**

Roller B'r'g St'l Track No. 14.....**\$2.30**

Hero, Adj. Track No. 19.....**50¢**

Adjustable Track Tandem Trolley Track No. 18.....**\$2.40**

Seal, Steel Track No. 5.....**\$2.40**

Trolley B. D. No. 17.....**\$1.40**

Trolley B. D. No. 120.....**\$2.35**

Trolley F. D. No. 121.....**\$2.45**

Trolley F. D. No. 150.....**\$2.60**

Safety Underwriters F. D. No. 101.....**\$2.25**

Tandem No. 44.....**70¢@5¢**

Trolley F. D. No. 151.....**\$3.00**

Palace, Adjustable Track No. 132.....**40¢@10¢**

Royal, Adjustable Track No. 122.....**40¢@10¢**

Ives' Wood Track No. 1.....**\$2.15**

Trolley B. D. No. 20.....**\$1.35**

Trolley B. D. No. 24.....**\$1.45**

Trolley B. D. No. 27.....**\$1.50**

Trolley B. D. No. 28.....**\$1.66**

Roller Bearings No. 39, 40, 41.....**70¢@5¢**

Anti-friction No. 42.....**60¢@10¢**

Hinged Tandem No. 48.....**60¢**

Folding Door B. B. Swivel No. 101.....**30¢**

Safety Door Hanger Co.:
 Storm King Safety.....**60¢**

U. S. Standard Hinge.....**60¢**

Stowell Mfg. & Foundry Co.:
 Acme Parlor Ball Bearing.....**40¢**

Ajax Hinge Door.....**60¢**

Alex. Parlor

Wrought Iron Hinges—

Strap and T Hinges, &c., list	December 20, 1904:	Extra 10% to 15%
Light Strap Hinges.....	70%	
Heavy Strap Hinges.....	75%	
Light T Hinges.....	65%	
Heavy T Hinges.....	60%	
Extra H y T H's.....	70%	
Hinge H's.....	50%	
Cor. Heavy Strap.....	75%	
Cor. Ex. Heavy T.....	70%	
Screw Hook.....	1 1/2 to 2 in. 10. 3 1/2	
and Strap.....	22 to 36 in. 10. 3 1/2	
Screw Hook and Eye.....	3/4 to 1 inch..... 10. 6	
1/2 inch.....	10. 7	
1/2 inch.....	10. 9	

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers.....35%

Hods— Coal—

Inch	Per doz.
15 16 17 18	
Galt. Open.....	\$2.50 2.75 3.00 3.25
Jap. Open.....	\$1.50 2.10 2.25 2.55
Galt. Funnel.....	\$3.00 3.30 3.60 3.90
Jap. Funnel.....	\$2.45 2.65 2.85 3.00

Masons, Etc.—Cleveland Wire Spring Co.:
Steel Mortar.....each \$1.45
Steel Brick.....each \$1.10**Hoes— Eye—**Scovill and Oval Pattern.....
60¢ to 10¢ to 10¢ to 10¢
Grub, list Feb. 23, 1899.....
70¢ to 10¢ to 10¢ to 10¢
D. & H. Scovill.....35%**Handled—**

NOTE—Manufacturers are selling from the list of September 1, 1904, but many jobs are still using list of August 1, 1899, or selling at net prices.

St. Madison Cotton Hoe.....70¢ to 10¢ to 10¢
St. Madison Crescent Cultivator Hoe.....70¢ to 10¢
St. Madison Mattock Hoes.....70¢ to 10¢
Regular Weight.....doz. 60%
Junior Size.....doz. \$4.00
St. Madison Sprouting Hoe.....doz. 50%
St. Madison Dixie Tobacco Hoe.....75¢ to 10¢
Kretzinger's Cut Easy.....70¢ to 10¢
Warren Hoe.....75¢ to 10¢
W. & C. Irons.....75¢ to 10¢
B. B. 6 in. Cultivator Hoe.....\$3.15
B. B. 6 1/2 in. \$3.35
Acme Wedging.....doz. net, \$4.35
W. & C. L'ning Shuffie Hoe.....doz. \$4.85

Hoisting Apparatus—

See Machines, Hoisting.

Holder— Bit—Angular, 3/4 doz. \$24.00.....45% to 10%
Bardsley's.....45%
Empire.....50%
Pullman.....50%**Door—**Bardsley's.....45%
Empire.....50%
Pullman.....50%**File and Tool—**

Nicholson File Holders and File Handles.....33% to 40%

Fruit Jar—

Triumph Fruit Jar Holder, 3/4 gross, \$10.80; 1/2 doz. \$1.25

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....50% to 10%
Ceiling, Sargent's List.....50% to 10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.....50% to 10%
Coat and Hat, Sargent's List.....50% to 10%
Clothes Line, Sargent's List.....70%
Coat and Hat, Reading.....45% to 20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....60%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—Belt.....80% to 10%
Wire C. & H. Hooks.....75% to 10% to 10% to 10%

Atlas, Coat and Hat.....75%
10 Case Lots.....75% to 10%
Columbian Hdw. Co. Gem.....60% to 10%
Parker Wire Goods Co. King.....75% to 10%
Van Wagner, Coat and Hat.....70%
Western W. C. Molding.....75%
Wire Goods Co.:
Acme.....60% to 10%
Chief.....70%
Crown.....70% to 10%
Czar.....65%
V Brace.....70% to 10%
Czar.....50% to 10%

Wrought Iron—Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$2.50.
Cotton.....doz. \$1.05 to \$1.25
Wrought Staples, Hooks, &c. See Wrought Goods.**Miscellaneous—**

Hooks, Bench, See Staps, Bench.
Bush, Light, doz. \$1.75; Medium, \$3.35; Heavy, \$6.25
Grass, best, all sizes, per doz. \$1.50
Grass, common grades, all sizes, per doz. \$1.30
Whiffletree.....10. 5% to 6%
Brass.....60% to 10% to 10% to 10%
Malleable Iron.....70% to 10% to 10% to 10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works, Self Locking Gate and Door Hook.....60%
St. Madison Cut-Easy Corn Hooks.....75%
Bench Hooks—See Bench Hooks.
Corn Hooks—See Knives, Corn.

Horse Nails—

See Nails, Horse.

Horseshoes—

See Shoes, Horses.

Hose, Rubber—

Garden Hose, 3/4-inch:
Competition.....ft. 5 @ 6¢
3-ply Standard.....ft. 8 @ 9¢
4-ply Standard.....ft. 10 @ 11¢
4-ply extra.....ft. 11 @ 13¢
4-ply extra.....ft. 14 @ 16¢
Cotton Garden, 3/4-in., coupled:
Low Grade.....ft. 8 @ 9¢
Fair Quality.....ft. 10 @ 11¢

Irons— Sad—

From 1/4 to 10.....lb. 3 1/2 @ 3¢
B. B. Sad Irons.....lb. 3 1/2 @ 3 1/2¢
Chinese Laundry.....lb. 3 1/2 @ 3 1/2¢
Chinese Sad.....lb. 4 @ 4 1/4¢
Mrs. Potts', cents per set:
Nos. 50 55 60 65
Jap'd Tops.....68 59 72 69
Tin'd Tops.....65 62 75 72
New England Pressing Iron, 3 1/2 @ 4 1/4¢

Pinking—

Pinking Irons.....doz. 50 @ 60¢

Soldering—Soldering Coppers, 2 1/2 & 3.20 @ 2 1/2¢
1 1/2 & 2.....22 @ 2 1/2¢**Jacks, Wagon—**Covert Mfg. Co.:
Auto Screw.....30 & 2¢
Steel.....45%
Covert's Saddlery Works:
Daisy.....60 & 10¢
Lockport.....60%
Lane's Steel.....30 & 10¢
Richards' Tiger Steel, No. 130.....40%**Knives—**Butcher, Kitchen, &c.—
Foster Bros. Butcher, &c.....30%
Smith & Hemenway Co.....40 & 10¢
Wilkinson Shear & Cutlery Co.....50%**Knives—**Butcher, Kitchen, &c.—
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Wilkinson Shear & Cutlery Co.....50%

Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3 1/4, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/4, \$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75;
Linen, No. 3 1/4, \$2.50; No. 4, \$3.50; No. 4 1/2, \$4.50.
Tent and Awning Lines: No. 5, White Cotton, \$7.50; Drab Cotton, \$8.50.
Clothes Lines, White Cotton: 50 ft., \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75; 100 ft., \$5.25.
Anniston Waterproof Clothes, 50 ft., \$7.00; \$24.00; Gilt Edge, \$22.00; Air Line, \$22.00; Acme, \$17.00; Advance, \$15.00; Empire, \$14.00; Albemarle, \$13.50; Oriole, \$20.00; Albemarle, \$13.50; Eclipse, \$12.50; Chicago, \$11.00; Standard, \$10.00; Columbia, \$8.50; Allston, \$12.50; Calhoun, \$11.00.

Locks— Cabinet—

Cabinet Locks.....33 1/2 @ 33 1/2¢ to 71 1/2¢

Door Locks, Latches, &c.—NOTE—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40 & 10¢
Stowell's Steel Door Latches.....50%**Elevator—**

Stowell's.....50%

Padlocks—Wrought Iron.....75¢ to 10¢ to 50¢ to 80¢ to 10¢
R. & E. Mfg. Co. Wrought Steel and Brass.....75¢ to 10¢ to 50¢ to 80¢ to 10¢**Sash, &c.—**Ives' Patent:
Bronze and Brass.....62 1/2¢
Crescent.....50¢ to 10¢
Iron.....60%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock.....40%
Reading.....40%**Machines—Boring—**Com. Up't, without Augers \$2.00
Com. Ang'l'r, without Augers \$2.25**Machines—Boring—**Com. Up't, without Augers \$2.00
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Com. Ang'l'r, without Augers \$2.25**Machines—Boring—**Com. Up't, without Augers \$2.00
Com. Ang'l'r,

Sand and Emery—

Flint Paper and Cloth, 60¢/10¢/10¢
Garnet Paper and Cloth, .25¢
Emery Paper and Cloth, 50¢/10¢/60¢

Parers—Apple—

Advance 1 doz. \$4.00
Baldwin 1 doz. \$4.00
Bonanza Improved each \$6.50
Daisy 1 doz. \$4.00
Dandy each \$7.50
Eurea Improved each \$2.00
Family Bay State 1 doz. \$15.00
Improved Bay State 1 doz. \$36.00
Little Star 1 doz. \$5.00
New Lightning 1 doz. \$7.00
Reading 72 1 doz. \$3.25
Reading 78 1 doz. \$6.25
Rocking Table 1 doz. \$6.20
Turn Table '98 1 doz. \$6.00
White Mountain 1 doz. \$5.00

Potato—

Saratoga 1 doz. \$7.00
White Mountain 1 doz. \$6.00

Picks and Mattocks—

List Feb 23, 1899 75¢/15¢/8¢
Cronk's Handled Garden Mattock 1 doz., \$6.40 33%

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass 60¢/60¢/10¢
Iron, list Nov. 11, '85 60¢/60¢/10¢

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in. 60%
Extra Heavy, 2-5 in. 70%
Fittings 75%

Pipe, Merchant—

Carload Lots.
Steel. Iron.
Blk. Galv. Blk. Galv.
1/4 & 1/2 in. .67 51 65 49
3/4 & 1 in. .71 59 69 57
1 to 6 in. .75 65 73 63 1/2
7 to 12 in. .70 55 68 53 1/2

Pipe, Vitriified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England 63%
New York and New Jersey 71%
Maryland, Delaware, E. Pa. 75%
West. Pa. and West Va. 71%
Virginia 76%
Ohio, Michigan and Ky. 77%
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:
C. L. L. C. L.
5 in., per 100 joints \$7.00
6 in., per 100 joints 8.50
7 in., per 100 joints 9.50

Planes and Plane Irons—

Wood Planes—
Bench, first qual. 40¢/10¢
Bench, second qual. 50¢/10¢
Molding 33¢/4¢/10¢
Bailey's (Stanley R. & L. Co.) 40%
Chapin-Stephens Co.:
Bench, First Quality 40¢/40¢/10¢
Bench, Second Quality 50¢/50¢/10¢
Molding 33¢/4¢/10¢
Toy and German 40¢/40¢/10¢
Chapin's 60%
Ohio Tool Co.:
Bench, First Quality 40¢/40¢/10¢
Bench, Second Quality 50¢/50¢/10¢
Molding 33¢/4¢/10¢
Adjustable Wood Bottom 60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.) 40%
Chapin's Iron Planes 50¢/10¢
Miscellaneous Planes (Stanley R. & L. Co.) 35%
Ohio Tool Co.'s Iron Planes 60¢/10¢
Sargent's 60¢/10¢
Union 60%

Plane Irons—

Wood Bench Plane Irons 25¢/10¢/30%
Buck Bros. 30%
Chapin-Stephens Co. 30%
Ohio Tool Co. 30%
Stanley R. & L. Co. 35%
Union 50%
L. & J. White 20¢/5¢/25%

Planters, Corn, Hand—

Kohler's Eclipse 1 doz. \$8.50

Plates—

Felice 1 lb. 3¢/4¢/4¢
Self-Sealing Pipe Plates (S. S. Co.) 1 doz. \$2.00 50%

Pliers and Nippers—

Button Pliers 75¢/10¢/80%
Gas Burner, per doz., 5 in., \$1.25 @ \$1.30; 6 in., \$1.45 @ \$1.50.
Gas Pipe, 7 8 10 12-in. \$2.00 \$2.25 \$3.00 \$3.75
Acme Nippers 50¢/50¢/5%
Cronk & Carrier Mfg. Co. 75¢/10¢
American Button 60%
Improved Button 60¢/10¢
Stub's Pattern 50%
Combination and others 33%
Heller's Farriers' Nippers 40¢/10¢/40¢/10¢
P. S. & W. Timmers' Cutting Nippers 30¢/30¢/10%
Swedish Side, End and Diagonal Cutting Pliers 50%
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels 30¢/30¢/10¢/10%
Chapin's Imp. Brass Cor. 60¢/40¢/10¢/10%
Pocket Levels 30¢/30¢/10¢/10%
Diston's Plumbs and Levels 70%
Diston's Pocket Levels 70%

C. E. Jennings & Co.'s Iron 33%
C. E. Jennings & Co.'s Iron, Adjustable 10¢/7%
Stanley R. & L. Co. 45%
Stanley's Duplex 45%
Wood Extension 33%

Poachers, Egg—

Buffalo Steam Egg Poachers, 1 doz. No. 1, \$6.00; No. 2, \$9.00; No. 3, \$9.00; No. 4, \$12.00 50%

Points, Glaziers—

Bulk and 1-lb. papers, 8 1/2¢/9¢ 1/2 lb. papers 1 lb. 9¢ @ 10¢ 1/2 1/4 lb. papers 1 lb. 9¢ @ 10¢ 1/4

Pokes, Animal—

Pt. Madison Hawkeye 1 doz. \$3.25
Pt. Madison Western 1 doz. \$4.00

Police Goods—

Manufacturers' Lists 25¢/25¢/5%

Polish—Metal, Etc—

Glasbrite, No. 2, 5 lb can (powder), each, \$1.25; 1 doz., \$12.00; No. 2, 10 lb can (cake), each, \$2.50; 1 doz., \$24.00.
Prestoline Liquid, No. 1 (1/2 pt.), 1 doz., \$3.00; No. 2 (1 qt.), \$9.72 40%
Prestoline Paste 40¢/10¢
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, 1 doz. \$0.40; 1 lb boxes, 1 doz. \$2.25.
U. S. Liquid, 8 oz cans, 1 doz., \$1.25; 1 doz. \$12.00.
Barkeepers' Friend Metal Polish, 1 doz., \$1.75; 1 doz. \$18.00.
Wynn's White Silk, 1/2 pt. cans, 1 doz. \$2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, 1 doz. \$10¢
Black Eagle, Liquid, 1/2 pt. cans, 1 doz. \$7.5¢
Black Jack's Paste, 3/4 lb cans, 1 doz. \$9.00
Black Kid Paste, 5 lb cans, each, \$0.65
Ladd's Black Beauty, 10 lb cans, 1 doz. \$5.75
Joseph Dixon's, 1/2 gr. \$5.75 10%
Dixon's Plumbago 10%
Firestone 10%
Gem, 1/2 gr. \$4.50 10%
Japanese 10%
Jet Black 10%
Peerless Iron Enamel, 10 oz cans, 1 doz. \$1.50
Wynn's:
Black Silk, 5 lb pail each 70¢
Black Silk, 1/2 lb box each \$1.00
Black Silk, 5 oz. box each \$0.75
Black Silk, 1/2 pt. liq. each \$1.00

Poppers, Corn—

1 qt., Square gro. \$9.00
1 qt., Round gro. \$10.00
1 1/2 qt., Square gro. \$11.00
2 qt., Square gro. \$13.00

Post Hole and Tree Augers and Diggers—

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6 1/2 ft., 48¢.
Steel Hitching Posts each \$1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enamelled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb. each 45¢
Fine Sporting, 1 lb. each 75¢
Rifle, 1/2 lb. each 15¢
Rifle, 1 lb. each 25¢
In Kegs:
12 1/2 lb. kegs \$1.54
25 lb. kegs \$1.50
King's Semi-Smokeless:
Keg (25 lb bulk) \$6.50
Half Keg (12 1/2 lb bulk) \$3.50
Quarter Keg (6 1/4 lb bulk) \$1.90
Case 24 (1 lb cans bulk) \$8.50
Half case (1 lb cans bulk) \$4.50
King's Smokeless:
Keg (25 lb bulk) \$12.00
Half Keg (12 1/2 lb bulk) 6.25 7.75
Quarter Keg (6 1/4 lb bulk) 3.25 4.00
Case 24 (1 lb cans bulk) 14.00 17.00
Half case 12 (1 lb c. bk.) 7.25 8.75
Robin Hood Smokeless Shot Gun 50¢/20%

Presses—

Fruit and Jelly—
Enterprise Mfg. Co. 20¢/25%
Seal Presses—
Morrill's No. 1, 1 doz. \$30.00 50%

Pruning Hooks and Shears

See Shears.

Pullers, Cork—

Invincible Cork Puller \$21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, 1 doz. \$12.00 33%
Morrill's No. 1, Nail Puller, 1 doz. \$20.00 50%
Pearson No. 1, Cyclone Spike Puller, each \$30.00 50%
Pelican, 1 doz. \$9.00 10¢/10%
Scranton, Case Lots:
No. 2B (large) \$5.50
No. 3B (small) \$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots 1 doz. \$6.00
Diamond B, No. 3, case lots 1 doz. \$5.50
Giant No. 1, 1 doz. \$19 40%
\$16.50; No. 3, \$15 40%
Parrot Tack and Stub Puller, 1 doz. 75¢; 1 doz. gro. \$6.00

Pulleys, Single Wheel—

1/2 in. 1 1/4 1 1/2 2 3
Avening or Tackle, 1 doz. \$0.30 .15 .60 1.05
Hay Fork, Squirrel or Solid Eye, doz., 4 in., \$1.25; 5 in., \$1.55
Inch 2 1/4 2 1/2
Hot House, doz. \$0.65 .85 1.20
Inch 1 1/4 1 1/2 1 3/4 2
Screw, doz. \$0.16 .19 .23 .30

Inch 1 1/4 2 2 1/2 2 1/2
Side, doz. \$0.25 .40 .55 .60
Inch 1 1/4 1 1/2 2 2 1/2
Stowell's:
Ceiling or End, Anti-Friction, 60¢/10%
Dumb Waiter, Anti-Friction, 60¢/10%
Electric Light 60%
Side, Anti-Friction 60¢/10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1 1/4 and 2 in. 16¢/19¢
Auger Mortise, no Face Plate, per doz., 1 1/4 and 2 in. 16¢/19¢
Acme 1 1/4 in., 16¢; 2 in., 19¢
1 oz. All-Steel, Nos. 3 and 7, 1 doz. 50¢
Grand Rapids All Steel Noiseless 50¢
Ideal 10¢/10%
Niagara 1 1/4 in., 16¢; 2 in., 19¢
No. 26, Troy, 1 1/4 in., 14¢; 2 in., 16¢
Star 1 1/4 in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern 60¢/60¢/10%
Pitcher Spout 80¢/80¢/10%
Wood Pumps, Tubing, &c. 45¢/50¢
Barnes Dbl. Acting (low list) 50%
Barnes' Pitcher Spout 75¢/10¢/5%
Contractors' Rubber Diaphragm No. 2 B. & L. Block Co. \$16.00
Daisy Spray Pump 1 doz. \$7.20
Flint & Walling's, Fast Mail Hand, (low list) 52%
Flint & Walling's Fast Mail (low list) 55¢/5%
Flint & Walling's Tight Top Pitcher 80%
National Specialty Mfg. Co., Measure, ing, 50¢ 30%
Mechanical Sprayer 37.20
Myers' Pumps (low list) 50%
Myers' Power Pumps 50%
Myers' Spray Pumps 50%

Pump Leathers—

Plunger and Lower Valve—Per gro.:
Inch. 2.20 2 1/4 2 1/2 2 3/4
Inch. \$2.20 2.50 2.75 3.00
Inch. 3 3 1/4 3 1/2 3 3/4
Inch. \$3.30 3.60 3.85 4.10 4.40

Plunger Cup Leathers—Per 100:

Inch. 2 1/2 3 3 1/4 4
Inch. \$2.75 3.85 5.00 6.00

Punches—

Saddlers' or Drive, good doz. 50¢/75¢
Spring, single tube, good quality \$1.75@2.00
Revolving (4 tubes) doz. \$3.50@3.75

Remis & Call Co.'s Cast St'l Drive 50%
Remis & Call Co.'s Chuck 55%
Morrill's No. 1 (A. B. C.), 1 doz. \$15.50
No. 2, 1 doz. \$22.50 50%
Hercules, each \$7.50 50%
Niagara Hollow Punches 40%
Niagara Solid Punches 55¢/10%
Sole Screw, B. & L. Mfg. Co. 50%
Timmers' Hollow, P. S. & W. Co. 50%
Timmers' Solid, P. S. & W. Co., 1 doz., \$1.44 60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Scribe Holes for Rd. Groove Wheels:
1/2 in. 3/4 in. 1 in. 100 feet.
\$2.50 \$3.00 \$3.40
Angular for Sq. Groove Wheels:
Small. Med. Large.
\$2.00 \$2.70 \$3.60 100 feet.
Sliding Door, Painted Iron 2 1/2¢/2 1/4¢

Sliding Door, Wrought Brass,

1/2 in., lb., 36¢ 30%
A. H. Mfg. Co.:
No. 1, Reliable Hgr. Track, 10 ft. 5 1/2¢
No. 2, Reliable Hgr. Track, 10 ft. 7¢
Cronk's:
Double Braced Steel Rail 10 ft. 3¢
O. N. T. Rail 2 1/4¢
Griffin's:
xxx, 100 ft., 1 x 3-16 in., \$3.00;
1 1/4 x 3-16 in., 3.50.
Hinged Hanger, 100 ft., 1 x 3-16 in., \$3.10; 1 1/4 x 3-16 in., \$3.60.
Lane's:
Hinged Track, 100 ft., 1 in., \$3.70;
1 1/4 in., \$4.40.
O. N. T., 100 ft., 1 in., \$2.75; 1 1/4 in., \$3.50; 1 1/2 in., \$4.00.
Standard, 1 1/4 in. 100 ft. \$1.00
Lawrence Bros.:
100 ft. No. 201, \$1.00; No. 202, \$1.40
New York, 1 x 3-16 in., 100 ft. \$2.75
McKinney's:
Hinged Hanger Rail, 10 ft., 1 1/4 in. 50%
None Better 10 ft. 3¢
Standard 10 ft. 4¢
Myers' Stave Track 60%
Richards' Mfg. Co.:
Common 1 x 3-16 in., \$2.75; 1 1/4 x 3-16, \$3.25; 1 1/2 x 3-16, \$3.50.
Special Hinged Hanger Rail \$4.40
Fire Door Track, 10 ft., 2 1/2 x 3/8, 15¢; 3 1/2 x 3/8, 9¢.
Lag Screw Rail, No. 65 40%
Gauge Trolley Track, 10 ft., No. 31, 10¢; No. 32, 15¢; No. 33, 21¢.
Safety Door Hanger Co.'s Storm King Safety 60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail 10 ft. 1 1/4¢
Steel Rail, Plain 25%
Wrought Bracket, 1 1/4 x 3-16 in., 10 ft. 3¢
Wrought Bracket, 1 1/2 x 3-16 in., 10 ft. 7¢
Swett's Hyle, 10 ft. 11¢
P. L. B. Steel Rail 100 ft. \$3.00
No. 0, 1 x 3-16 in., 100 ft. \$2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn \$3.25
Fort Madison Blue Head Lawn \$2.70
Jackson Lawn, 29 and 30 teeth \$4.25
doz., net.

Cronk's:
New Champion Garden, 1 doz., 12 teeth, \$15.00; 14, \$16.50; 16, \$18.00 75%
Victor Garden, 1 doz., 12 teeth, \$15.00; 14, \$16.50; 16, \$18.00 75¢/25%
Queen City Lawn, 1 doz., 20 teeth, \$3.45; 24, \$3.60 40%
Anticlog Lawn, 1 doz. \$1.00
Malleable Garden 70¢/10%

Kohler's:
Lawn Queen, 20-tooth 1 doz. \$3.45
Lawn Queen, 24-tooth 1 doz. \$3.60
Paragon, 20-tooth 1 doz. \$2.75
Paragon, 24-tooth 1 doz. \$3.00
Steel Garden, 14-tooth 1 doz. \$2.88
Malleable Garden, 14-tooth, 1 doz. \$1.75@2.00
Weldless Steel Garden 75¢/5%

Rasps, Horse—

Diston's 75%
Heller Bros. 70¢/5¢/10¢/5%
McCaffrey's American Std'd 60¢/10¢/5%
New Nicholson 70¢/10¢/75%
See also Files.

Razors—

Boracic 60%
Fox Razors, No. 42 1 doz. \$20.00
Fox Razors, No. 44 1 doz. \$20.00
Fox Razors, No. 82, Platina 1 doz. \$25.00
Red Devil 60%
Sage & Hatch:
Arbo Anti-Rust 1 doz. \$10.00
Herbrand 1 doz. \$6.00
Barber 1 doz. \$6.00
Silberstein:
Carbo Magnetic \$18.00
Griffin, No. 65 \$15.00
Griffin, No. 00 \$12.00
All other Razors 40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Headryx:
M 6, Q 6, A 6, B 6, M 9%, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickered Populo 20%
Aluminum, German Jilt, Bronze, 25%
1240 N. 124 N. 20%
3004 N. 106 N. 6 BM. G 9 25%
4 N. 6 PN. 24 N. 25 PN 20%
2904 PN 33%
2904 PN 33%
0224 N 33%
02204 PN 33%
802 N 33%
982 PN, 2901 N, 971 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 0304 P, 0304 PN, 33%
Registers—List July 1, 1903.
Japanned, Electroplated and Bronzed 70¢/10%
Bronzed 75%

Revolvers—

Single Action 95¢@1.00
Double Action, except 44 cal. \$1.85
Double Action, 44 caliber \$2.00
Automatic \$3.45
Hammerless \$1.00
NOTE.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in. per doz. \$2.25@2.50
17 in. per doz. \$2.50@2.75
18 in. per doz. \$2.75@3.00

Rings and Ringers—

Bull Rings—
Steel \$0.70 0.75 0.80 doz.
Copper \$1.00 1.15 1.40 doz.
Rea's Improved Self-Piercing, Copper, 2 in., 1 doz. \$1.25; 2 1/2 in., \$1.50; 3 in., \$1.75.
Hog Rings and Ringers—
Hill's Rings, gro. boxes \$4.00@4.50
Hill's Ringers, Gray Iron doz. 50¢/55¢
Hill's Ringers, Malleable Iron doz. 70¢/75¢
Blair's Rings per gro. \$4.75@5.25
Blair's Ringers, per doz. \$0.60@.65
Brown's Rings per gro. \$5.00@5.50
Brown's Ringers, per doz. \$0.60@.65

Rivets and Burrs—

Copper 50¢/10¢/60%
Iron or Steel 75¢/75¢/5%

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list 60%
Cronk's Stay 72¢
Cronk's Brinkhoff 90¢
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 33.50
O. K. Adj. and Reversible No. 58.50
Lag Screw, Nos. 55 and 57 50%
Fire Door 40%
Favorite, No. 54 40%
Stowell's Barn Door Stay 100 ft. \$1.00
Swett's Anti-Friction 50%
Screw and Spike Stay 100 ft. 65¢
Hinge Adjustable Stay 100 ft. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure 1 lb. 1 1/4¢/12¢
Sisal, 7-16 in. diam. and larger:
Mixed 1 lb. 8¢/8 1/4¢
Pure 1 lb. 9 1/4¢/9 1/2¢
Sisal, 1/4 in. and larger:
Ropes, Medium and Coarse:
Mixed 1 lb. 8¢/8 1/4¢
Pure 1 lb. 9 1/4¢/9 1/2¢
Sisal, Tarred, Medium Luth Varn:
Mixed 1 lb. 7 1/2¢
Pure 1 lb. 9¢
Cotton Rope: 1 lb.
Best, 1/4 in. and larger 16¢
Medium, 1/4 in. and larger 11¢
Common, 1/4 in. and larger 10 1/2¢
Jute Rope:
Thread No. 1, 1/4 in. & up, 1 lb. 6 1/4¢

Oil Stones, &c.—

Chicago Wheel & Mfg. Co. 1901 list:	
Gem Corundum Oil Double Grit. 50%	
Gem Corundum Oil, Single or Double Grit. 55%	
Gem Corundum Slips. 55%	
Gem Corundum Razor Hones. 55%	
Pike Mfg. Co. 1901 list:	
Arkansas St. No. 1, 3 to 5 in. \$2.80	
Arkansas Slips No. 1. 4.00	
Lily White Washita, 4 to 8 in. 60c	
Washita St., Extra, 4 to 8 in. 50c	
Washita St., No. 1, 4 to 8 in. 40c	
Washita St., No. 2, 4 to 8 in. 30c	
Lily White Slips. 90c	
Rosy Red Slips. 90c	
Washita Slips, Extra. 80c	
Washita Slips, No. 1. 70c	
Washita Slips, No. 2. 60c	
India Oil Stones (entire list). 33 1/2%	
Quickcut Emery and Corundum Oil Stone, Double Grit. 33 1/2%	
Quickcut Emery and Corundum Oil Stone, Double Grit. 33 1/2%	
Quickcut Emery Rubbing Bricks. 33 1/2%	
Hindustan No. 1, R. G. lar. 1 lb. 8c	
Hindustan No. 1, Small. 1 lb. 10c	
Aze Stones (all kinds). 25%	
Turkey Oil Stones, Extra. 10c	
8 in. 20c	
Queer Creek Stones, 4 to 8 in. 20c	
Queer Creek Slips. 20c	
Sand Stone. 10c	
Belgian, German and Swaty Razor Hones. 50%	
Natural Grit Carving Knife Hones. 40%	
Quick Edge Pocket Knife Hones. 40%	
Mounted Kitchen Sand Stone. 40%	

Stoners, Cherry—

Enterprise 25@30%

Stoppers, Bottle—

Victor Bottle Stoppers. 40 gro. \$0.00

Stops—Bench—

Millers Falls. 15-10%

Morrill's, 40 doz. No. 1, \$10.00. 10%

Morrill's, No. 2, \$12.50. 10%

Door—

Chapin-Stephens Co. 60@60&10%

Plane—

Chapin-Stephens Co. 20%

Straps—Box—

Cary's Universal, case lots. 20&10&10%

Hame—

Covert's Saddlery Works. 60&10%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%

Socket 60@60&10%

Excelsior Stratcher and Tack Hammer Combined, 40 doz. \$6.00. 20%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7 1/2%

National Specialty Co., list Jan. 1, 1902. 30&5%

Sweepers, Carpet—

National Sweeper Co.: 40 doz.

Auditorium, Roller Bearing (26 in. case), Nickel. 54.00

Mammoth, Roller Bearing (30 in. case), Nickel. 60.00

Marion, Roller Bearing, regular finishes, full Nickel. 32.00

Marion Queen, Roller Bearing, full Nickel. 32.00

Monarch, Roller Bearing, full Nickel. 32.00

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